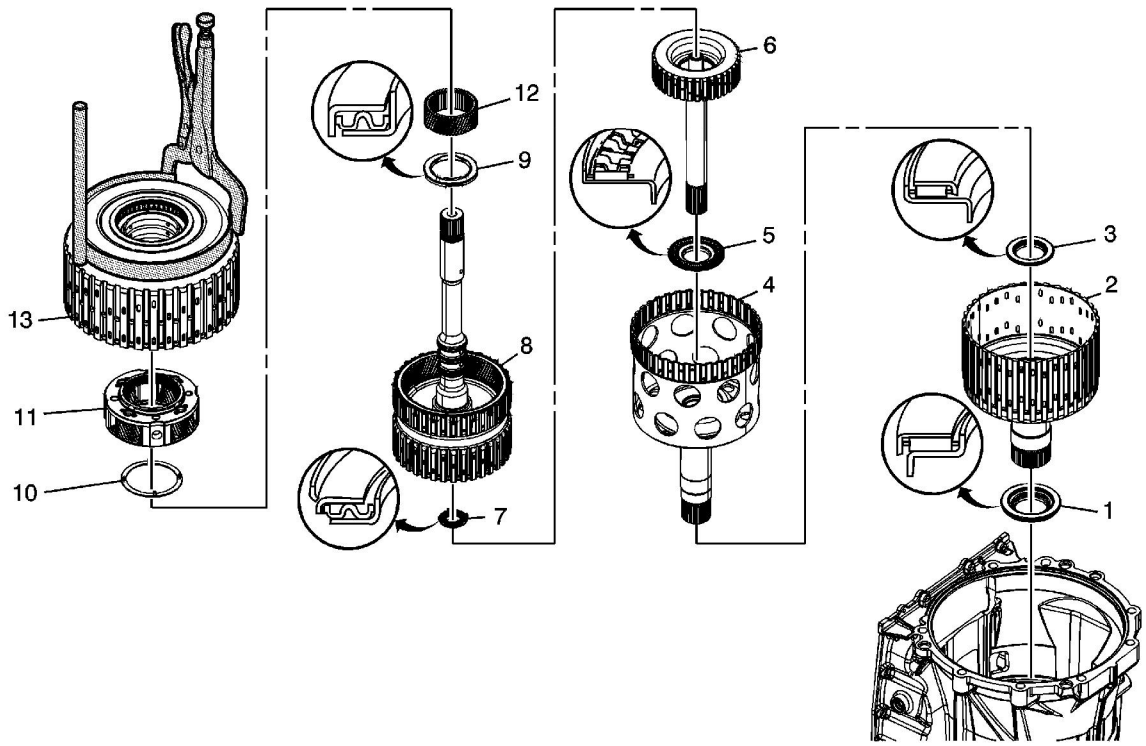
1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Installation



Callout	Component Name
1	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
2	2-6 and 3-5 Reverse Clutch (with Output Carrier Outer Sun Gear Shaft) Hub Assembly
3	1-2-3-4 Clutch Hub Thrust Bearing Assembly
4	1-2-3-4 Clutch (with Output Carrier Inner Sun Gear Shaft) Hub Assembly
5	4-5-6 Clutch Hub Thrust Bearing Assembly
6	4-5-6 Clutch (with Output Carrier Shaft and Dampener) Hub Assembly **Tip** Refer to 4-5-6 Clutch Dampener Overhaul .
7	Turbine Shaft Thrust Bearing Assembly
8	4-5-6 (with Turbine Shaft) Clutch Assembly
9	Input Sun Gear Thrust Bearing **Tip** Thrust bearing snaps onto input carrier assembly.

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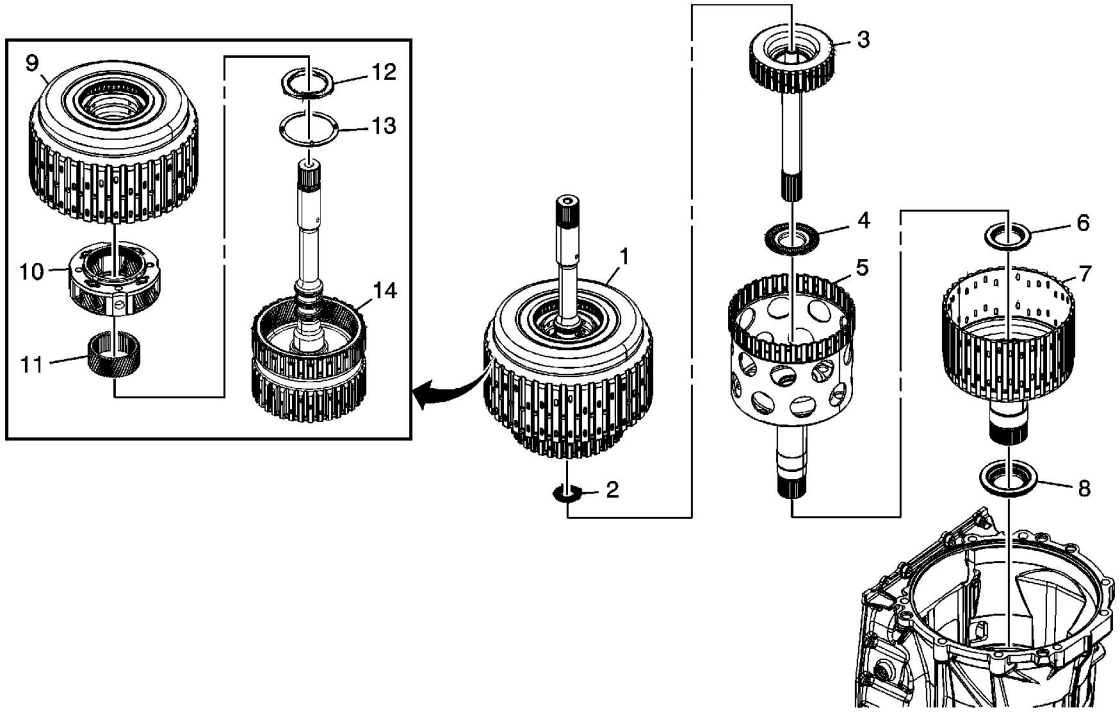
10	Input Sun Gear Thrust Washer
11	Input Carrier Assembly
12	Input Sun Gear
13	1-2-3-4 and 3-5 Reverse Clutch Assembly **Tip** Wiggle the DT 47781 in order to align the 1-2-3-4 and 3-5 reverse clutch plates with the external splines of the 4-5-6 clutch assembly. To verify that the 1-2-3-4 and 3-5 reverse clutch assembly is fully installed, lift up on the turbine shaft. There should not be any noticeable slack. **Special Tool** DT 47781 C1234 35R Clutch Assembly Installer

1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 Clutch Assembly Removal



Callout	Component Name
1	1-2-3-4 and 3-5 Reverse Clutch Assembly and 4-5-6 (With Turbine Shaft) Clutch Assembly
2	Turbine Shaft Thrust Bearing Assembly
3	4-5-6 Clutch (With Output Carrier Shaft and Dampener) Hub Assembly
4	4-5-6 Clutch Hub Thrust Bearing Assembly
5	1-2-3-4 Clutch (With Output Carrier Inner Sun Gear Shaft) Hub Assembly
6	1-2-3-4 Clutch Hub Thrust Bearing Assembly
7	2-6 and 3-5 Reverse Clutch (With Output Carrier Outer Sun Gear Shaft) Hub Assembly
8	2-6 and 3-5 Reverse Clutch Hub Thrust Bearing Assembly
9	1-2-3-4 and 3-5 Reverse Clutch Assembly
10	Input Carrier Assembly
11	Input Sun Gear
12	Input Sun Gear Thrust Bearing
13	Input Sun Gear Thrust Washer

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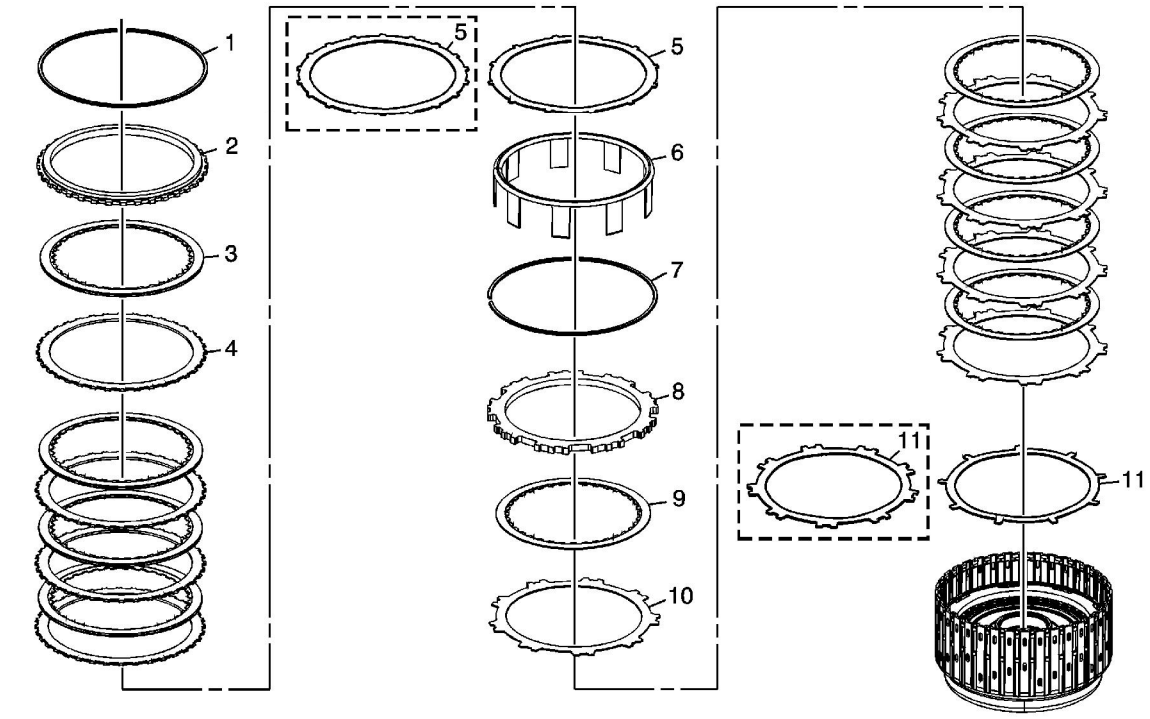
14	4-5-6 (With Turbine Shaft) Clutch Assembly

1-2-3-4 and 3-5 Reverse Clutch Overhaul

Table 1: 1-2-3-4 and 3-5 Reverse Clutch Plates Removal
Table 2: 1-2-3-4 Clutch Piston Removal
Table 3: 3-5 Reverse Clutch Piston Removal
Table 4: 1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement
Table 5: 3-5 Reverse Clutch Piston Installation
Table 6: 1-2-3-4 Clutch Piston Installation
Table 7: 1-2-3-4 Clutch Plate Installation
Table 8: 3-5 and Reverse Clutch Plate Installation
Table 9: 1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

1-2-3-4 and 3-5 Reverse Clutch Plates Removal



1-2-3-4 and 3-5 Reverse Clutch Plates Removal

Callout	Component Name
1	3-5 Reverse Clutch Backing Plate Retaining Ring
2	3-5 Reverse Clutch Backing Plate
3	3-5 Reverse Clutch Plate Assembly (Qty: 4)
4	3-5 Reverse Clutch Plate (Qty: 4)

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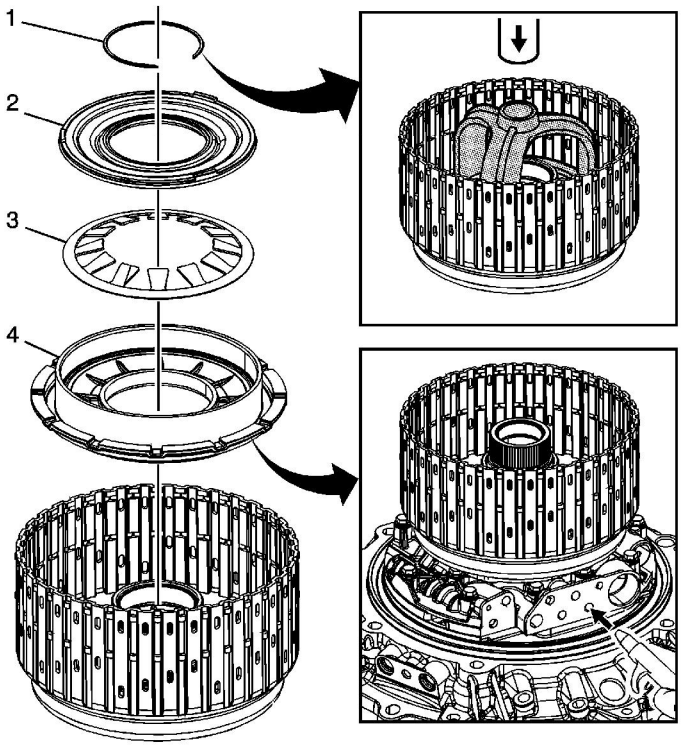
5	3-5 Reverse Clutch (Waved) Plate
6	3-5 Reverse Clutch Apply Ring
7	1-2-3-4 Clutch Backing Plate Retaining Ring
8	1-2-3-4 Clutch Backing Plate
9	1-2-3-4 Clutch Plate Assembly (Qty: 5)
10	1-2-3-4 Clutch Plate (Qty: 5)
11	1-2-3-4 Clutch (Waved) Plate

1-2-3-4 Clutch Piston Removal

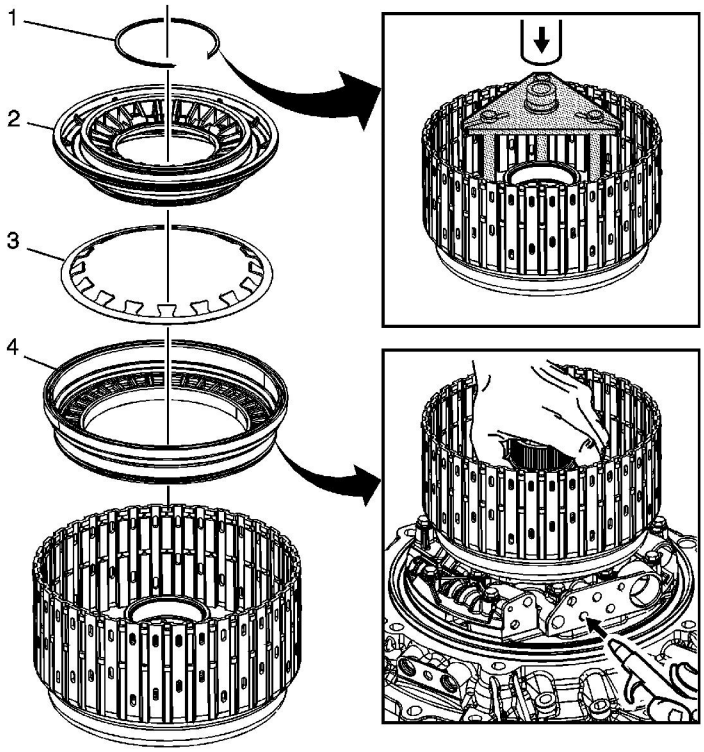


1-2-3-4 Clutch Piston Removal

Callout	Component Name
1	1-2-3-4 Clutch Piston Dam Retaining Ring. **Caution:** Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it. **Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Special Tool** J 38734 Intermediate Spring Compressor Adapter

2	1-2-3-4 Clutch Piston Dam Assembly
3	1-2-3-4 Clutch Spring
4	1-2-3-4 Clutch Piston **Tip** • It may be necessary to apply air to the apply passage in order to remove the piston. Install the 1-2-3-4 clutch housing onto the torque converter (with fluid pump) housing assembly in order to apply air. • After air is applied, it may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

3-5 Reverse Clutch Piston Removal

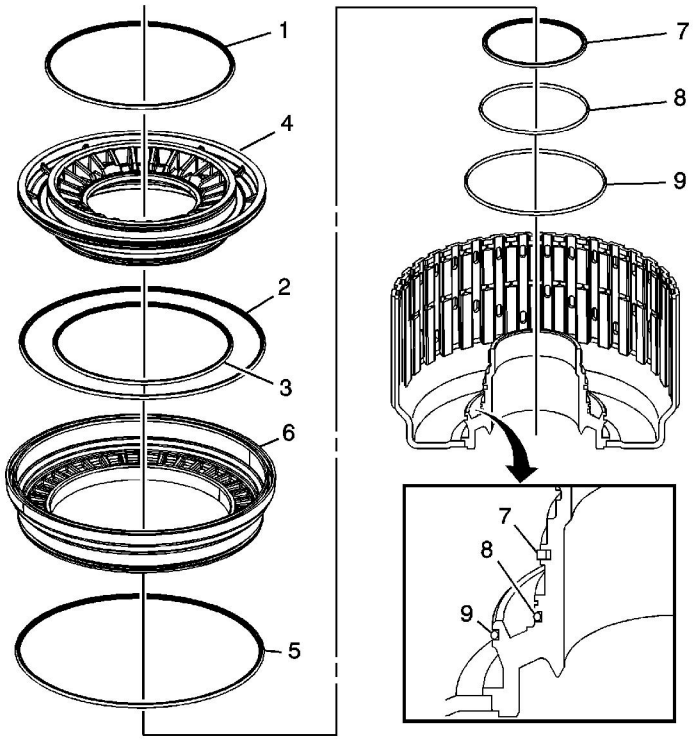


3-5 Reverse Clutch Piston Removal

Callout	Component Name
Preliminary Procedure 1. Install the 1-2-3-4 and 3-5 reverse clutch housing assembly onto the torque converter (with fluid pump) housing assembly. 2. Apply hand pressure on the 1-2-3-4 clutch piston housing while applying compressed air to the apply passage in order to unseat the 3-5 reverse clutch piston.	
	1-2-3-4 Clutch Piston Housing Retaining Ring

1	**Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Special Tool** DT 47867 Adjustable Clutch Spring Compressor
2	1-2-3-4 Clutch Piston Housing
3	3-5 Reverse Clutch Spring
4	3-5 Reverse Clutch Piston **Tip** It may be necessary to turn the housing assembly upside down and carefully tap the housing against a flat surface in order to release the piston.

1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

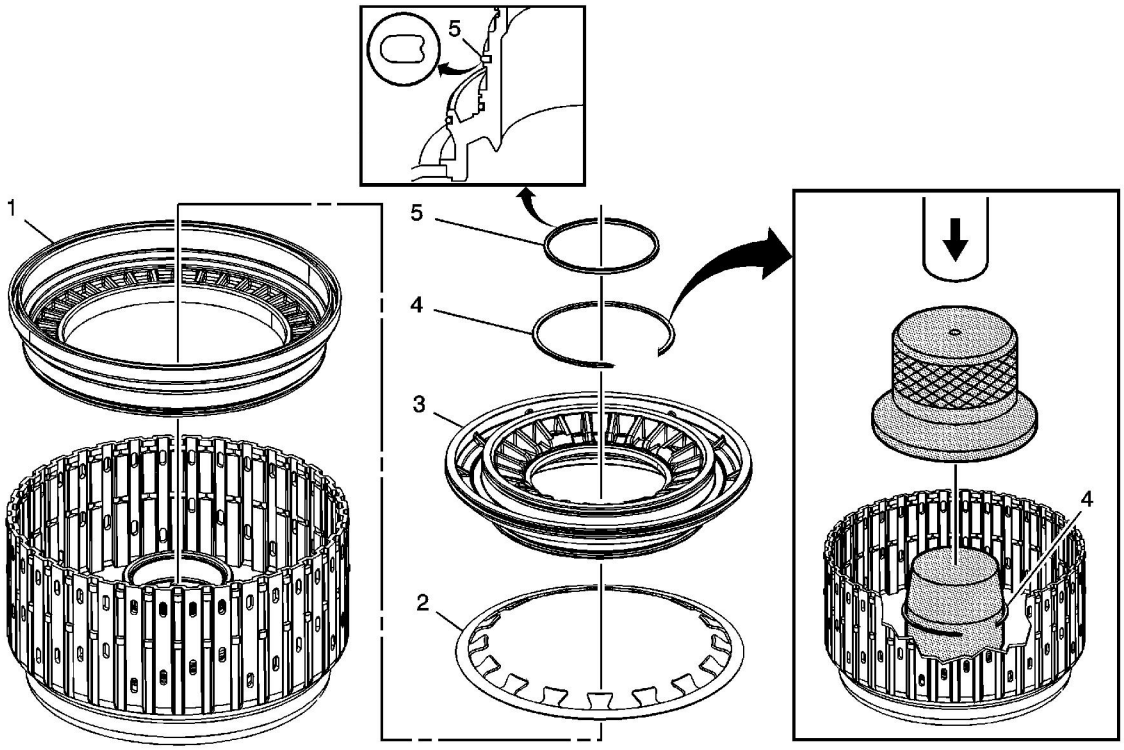


1-2-3-4 and 3-5 Reverse Clutch Piston Seals Replacement

Callout	Component Name
Caution: Refer to Seal Reuse Caution in the Preface section. **Preliminary Procedure** Lubricate all seals with automatic transmission fluid (ATF) prior to installation.	
1	1-2-3-4 Clutch Piston Seal

2	3-5 Reverse Clutch Piston Dam (O-Ring) Seal
3	3-5 Reverse Clutch Piston Inner Seal
4	1-2-3-4 Clutch Piston Housing
5	3-5 Reverse Clutch Piston Outer Seal
6	3-5 Reverse Clutch Piston
7	1-2-3-4 Clutch Piston Inner Seal **Caution:** Do not install a NEW 1-2-3-4 clutch piston inner seal yet. A special tool used to install the 1-2-3-4 clutch piston housing retaining ring may damage the seal if the seal is installed prior to installing the retaining ring. Refer to 3-5 Reverse Clutch Piston Installation.
8	1-2-3-4 Clutch Piston Housing Seal
9	1-2-3-4 Clutch Piston Housing Seal

3-5 Reverse Clutch Piston Installation

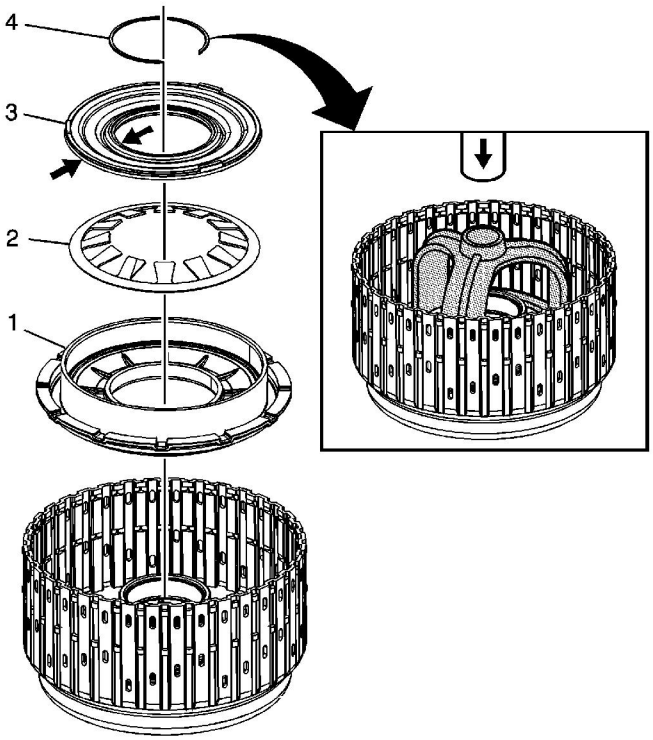


3-5 Reverse Clutch Piston Installation

Callout	Component Name
1	3-5 Reverse Clutch Piston
2	3-5 Reverse Clutch Spring **Caution:** Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.

3	1-2-3-4 Clutch Piston Housing
4	1-2-3-4 Clutch Piston Housing Retaining Ring **Caution:** Before using the DT 47782-2, push the retaining ring over the DT 47782-1 by hand so that the ring is positioned below the tapered area of the DT 47782-1. If the ring is positioned above the tapered area when it is being installed, the ring will become lodged between both tools and damage to the tools, retaining ring, and piston housing will result. **Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Caution:** Push the retaining ring down over the cone until the ring seats firmly in the retaining ring groove. The retaining ring will make a distinctive click sound when it seats. Failure to properly seat the retaining ring may cause damage to the 3-5 reverse clutch assembly. **Tip** Use a screwdriver in order to verify the retaining ring is fully seated into the groove. It may appear as though the retaining ring is not fully seated, since the groove is shallow by design. However, this shallow interface is normal. **Special Tools** • DT 47782-1 Retaining Ring Cone • DT 47782-2 Retaining Ring Installer
5	1-2-3-4 Clutch Piston Inner Seal **Caution:** Install a NEW seal and orientate as shown. Failure to do so may cause internal transmission leaks and damage to the transmission.

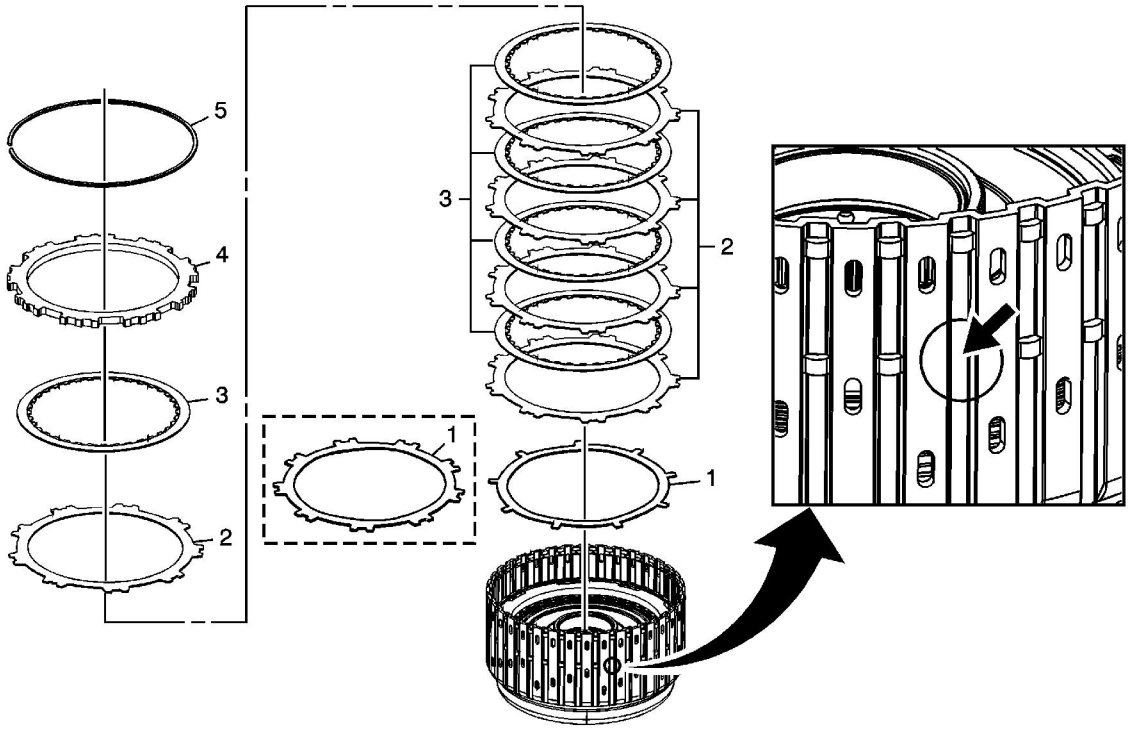
1-2-3-4 Clutch Piston Installation



1-2-3-4 Clutch Piston Installation

Callout	Component Name
1	1-2-3-4 Clutch Piston
2	1-2-3-4 Clutch Spring **Caution:** Ensure the clutch spring is centered on the piston with the tabs facing up. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Piston Dam Assembly **Tip** Lubricate the inner and outer surfaces of the dam assembly with ATF in order to ease installation into the piston. Install the tabs facing up.
4	1-2-3-4 Clutch Piston Dam Retaining Ring **Caution:** Use care when compressing the 1-2-3-4 clutch spring and dam assembly. Compressing the dam assembly too much may damage it. **Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Special Tool** J 38734 Intermediate Spring Compressor Adapter

1-2-3-4 Clutch Plate Installation

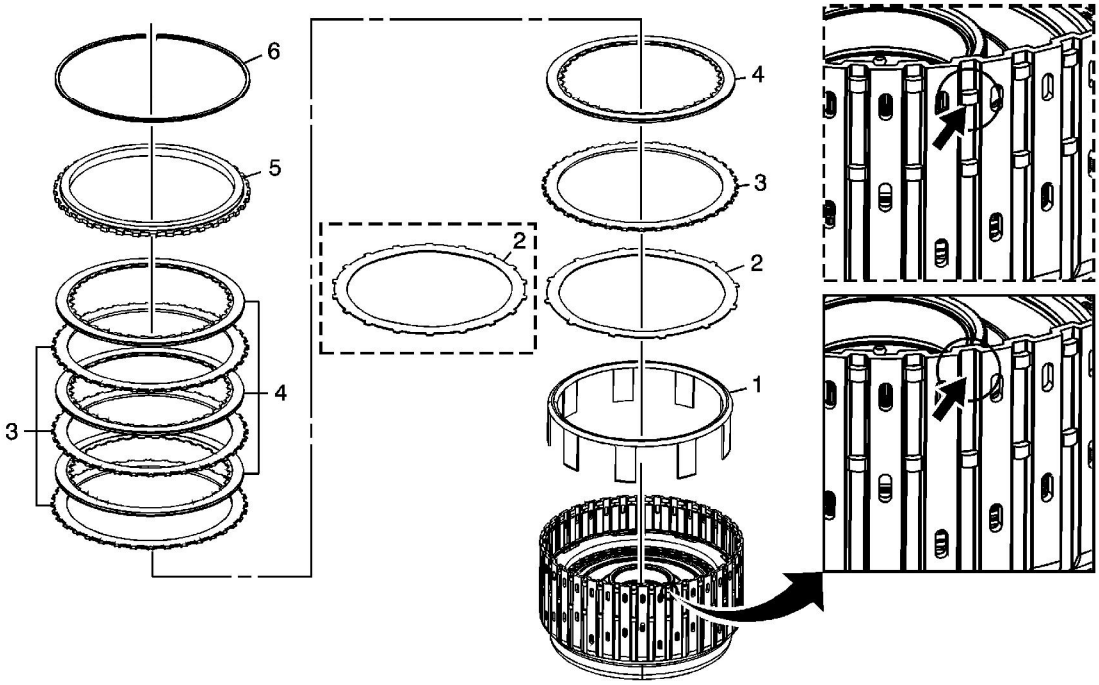


1-2-3-4 Clutch Plate Installation

Callout	Component Name
1	1-2-3-4 Clutch (Waved) Plate **Caution:** To avoid damaging the seal, first place J 46624-1 with the small chamfer end facing up and leave in place for at least 60 seconds.
2	1-2-3-4 Clutch Plate (Qty: 5) **Caution:** Ensure all clutch plates are centered in the housing. When installing the first steel clutch plate, ensure an opening between the external splines is centered over the missing snap ring groove punch in the housing. Align the external splines of each remaining steel clutch plate with the first steel clutch plate. Failure to do so may cause damage to the clutch assembly.
3	1-2-3-4 Clutch Plate Assembly (Qty: 5)
4	1-2-3-4 Clutch Backing Plate **Caution:** Align the external splines of the backing plate with the external splines of the steel clutch plates. Failure to do so may cause damage to the clutch assembly.
5	1-2-3-4 Clutch Backing Plate Retaining Ring **Caution:** Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly. **Tip**

	After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to 1-2-3-4 Clutch Backing Plate Retaining Ring Measurement.

3-5 and Reverse Clutch Plate Installation

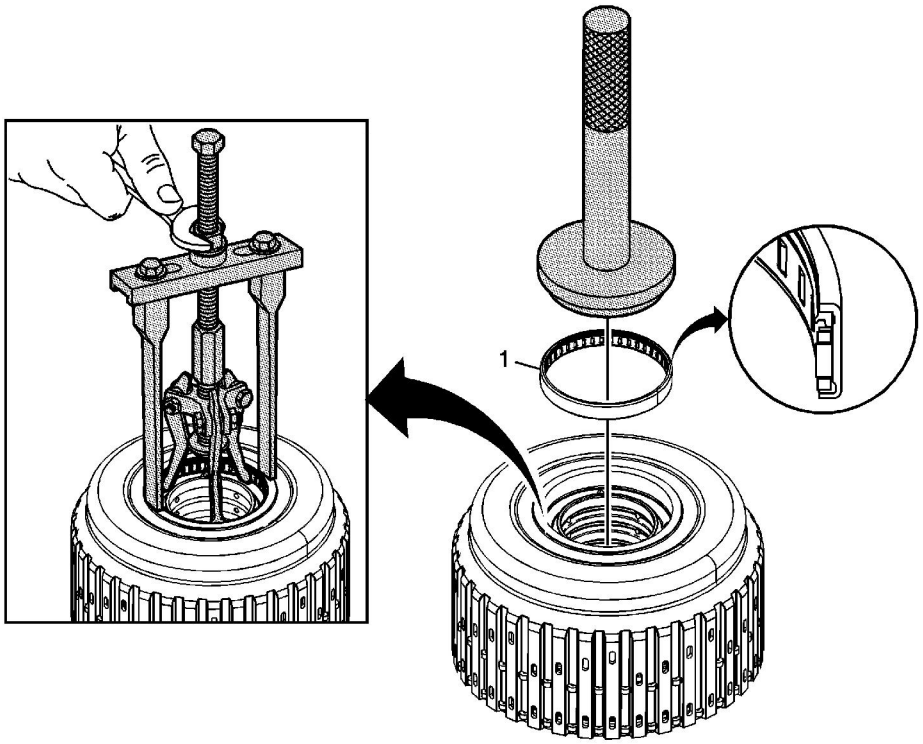


3-5 and Reverse Clutch Plate Installation

Callout	Component Name
1	3-5 Reverse Clutch Apply Ring **Caution:** Ensure apply ring legs are positioned into the 3-5 reverse clutch piston. Failure to do so may cause damage to the 3-5 reverse clutch assembly.
2	3-5 Reverse Clutch (Waved) Plate
3	3-5 Reverse Clutch Plate (Qty: 4)
4	3-5 Reverse Clutch Plate Assembly (Qty: 4)
5	3-5 Reverse Clutch Backing Plate
6	3-5 Reverse Clutch Backing Plate Retaining Ring **Caution:** Depending on the housing configuration, align the retaining ring gap with the missing snap ring groove punch in the housing or the offset punch in the housing. Failure to do so may cause damage to the clutch assembly. **Tip** After the retaining ring is installed, determine clutch piston travel in order to verify

	if the correct selective retaining ring is being used. Refer to 3-5 Reverse Clutch Backing Plate Retaining Ring Measurement.

1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

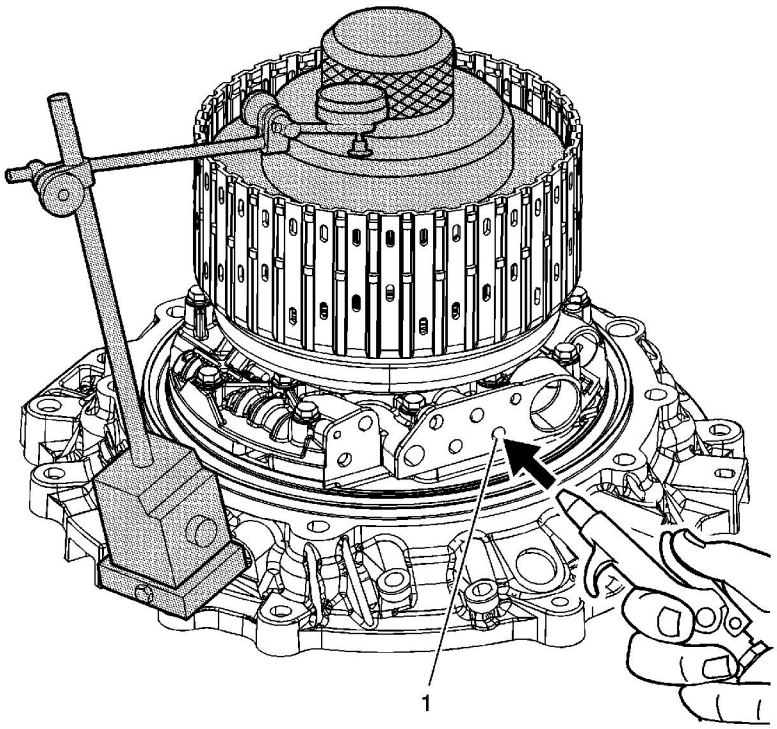


1-2-3-4 and 3-5 Reverse Clutch Bearing Assembly Replacement

Callout	Component Name
1	3-5 Reverse Clutch Bearing **Caution:** Install the NEW bearing assembly with the seal side up. Improper installation of the bearing may cause damage to the transmission. **Caution:** Do not reuse the bearing. Install a NEW bearing. Reusing an old bearing may cause damage to the transmission. **Specification** Install the bearing flush to 0.3 mm below the thrust surface. **Special Tools** • DT 47865 Bearing Remover • DT 47866 Bearing Installer • J 8092 Driver Handle

- J 45124 Removal Bridge

1-2-3-4 Clutch Backing Plate Retaining Ring Measurement



Callout	Component Name
	Preliminary Procedures
	1. Install the 1-2-3-4 and 3-5 reverse clutch housing with the 1-2-3-4 clutch plates installed, onto the torque converter housing. 2. Install the DT 47868-2 onto the torque converter housing. 3. Install DT 47868-1 D onto the 1-2-3-4 clutch backing plate. 4. Install the J 26900-13 J onto DT 47868-2 . 5. Attach the J 8001 to the J 26900-13 and zero out the dial indicator on the DT 47868-1 .
	Special Tools • DT 47868-1 Clutch Pack Travel Weight • DT 47868-2 Magnetic Base Adapter • J 8001 Dial Indicator Set • J 26900-13 Magnetic Base
	1-2-3-4 Clutch Apply Passage

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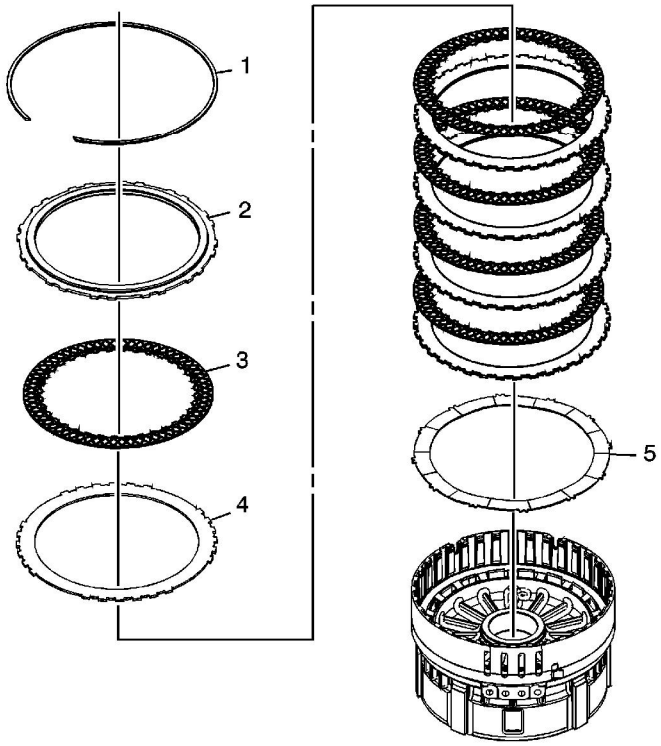
1	**Tip** Apply compressed air to the apply passage hole, at least 3 times and observe the dial indicator measurement each time. This action "fluffs" the clutch plates to make sure an accurate measurement. Refer to Clutch Backing Plate Retaining Ring Specifications .

2-6 Clutch Overhaul (6L80)

Table 1: 2-6 Clutch Plates Removal
Table 2: 2-6 Clutch Piston Replacement
Table 3: 2-6 Clutch Plates Installation

2-6 Clutch Plates Removal



2-6 Clutch Plates Removal

Callout	Component Name
1	2-6 Clutch Backing Plate Retaining Ring
2	2-6 Clutch Backing Plate
3	2-6 Clutch Plate Assembly (Qty: 5)
4	2-6 Clutch Plate (Qty: 5)
5	2-6 Clutch (Waved) Plate

2-6 Clutch Piston Replacement

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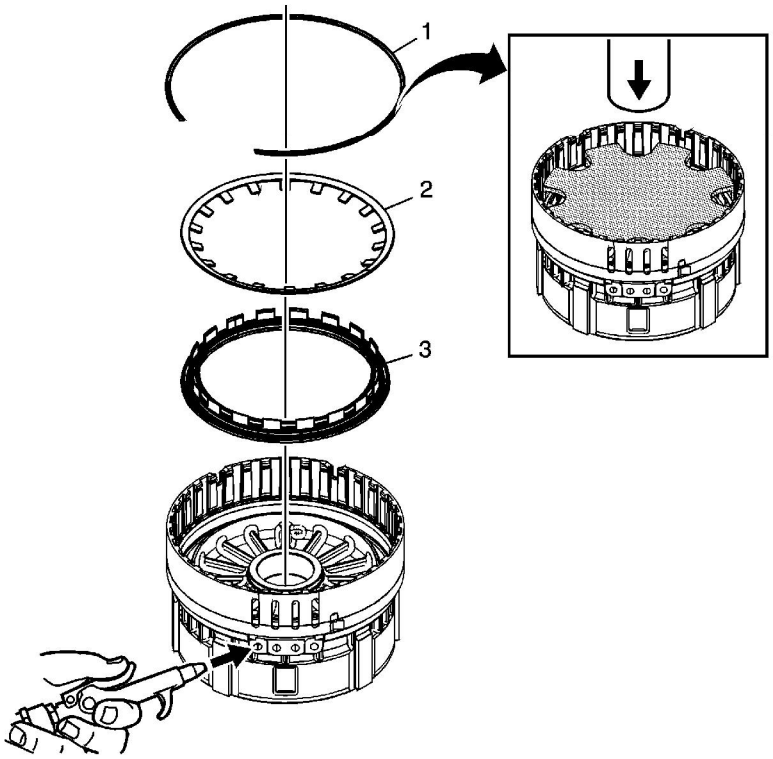
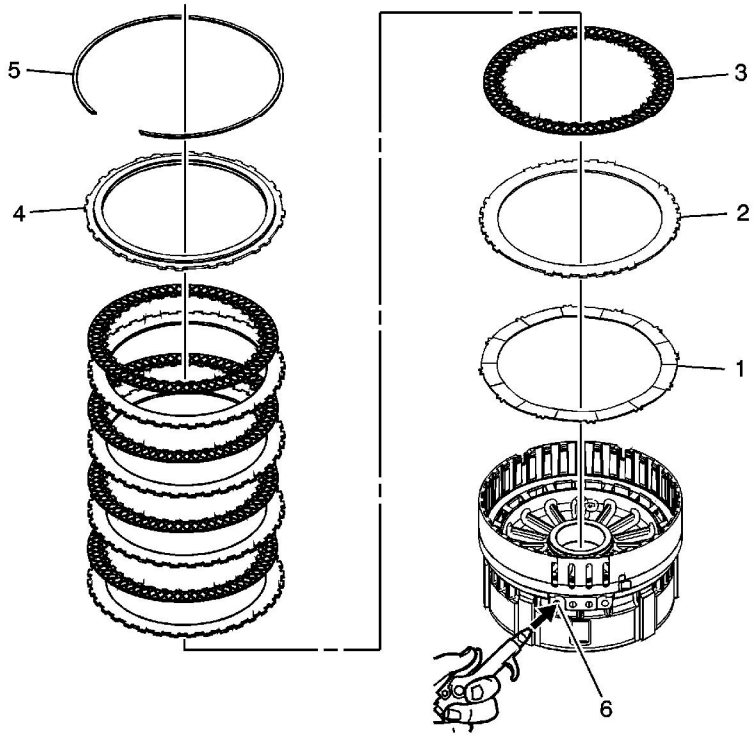


2-6 Clutch Piston Replacement

Callout	Component Name
1	2-6 Clutch Spring Retaining Ring **Tip** Ensure the *DT 47761* spring compressor is centered over the clutch spring. **Special Tool** *DT 47761* Clutch Spring Compressor For equivalent regional tools, refer to Special Tools.
2	2-6 Clutch Spring **Caution:** Ensure the spring tabs are facing down during installation and that the tabs fit between the teeth on the piston. Failure to do so may cause damage to the clutch assembly.
3	2-6 Clutch Piston Assembly **Tip** It may be necessary to apply air to the apply passage in order to unseat the piston.

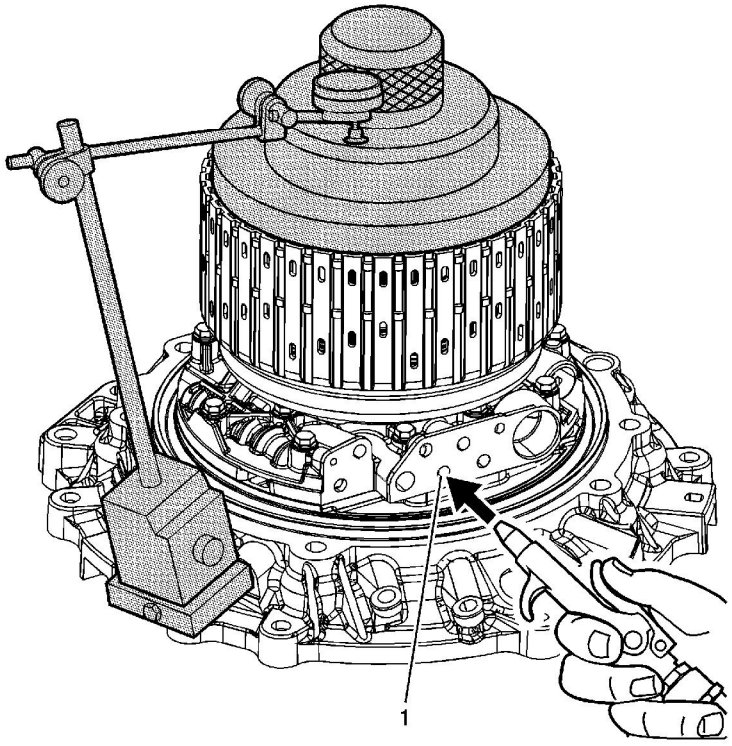
2-6 Clutch Plates Installation



2-6 Clutch Plates Installation

Callout	Component Name
1	2-6 Clutch (Waved) Plate
2	2-6 Clutch Plates (Qty: 5) **Tip** Alternate between steel and fiber clutch plates.
3	2-6 Clutch Plate Assembly (Qty: 5) **Tip** Alternate between steel and fiber clutch plates.
4	2-6 Clutch Backing Plate
5	2-6 Clutch Backing Plate Retaining Ring
6	2-6 Clutch Apply Passage **Tip** Apply air to verify proper installation of all 2-6 clutch components.

3-5 Reverse Clutch Backing Plate Retaining Ring Measurement



Callout	Component Name
	Preliminary Procedures
	1. Install the 1-2-3-4 and 3-5 reverse clutch housing with the 1-2-3-4 and 3-5 reverse clutch plates installed, onto the torque converter housing. 2. Install the DT 47868-2 onto the torque converter housing. 3. Install DT 47868-1 onto the 3-5 reverse clutch backing plate. 4. Install the J 26900-13 onto DT 47868-2 . 5. Attach the J 8001 to the J 26900-13 and zero out the dial indicator on the DT 47868-1 .
	Special Tools • DT 47868-1 Clutch Pack Travel Weight • DT 47868-2 Magnetic Base Adapter • J 8001 Dial Indicator Set • J 26900-13 Magnetic Base
	3-5 Reverse Clutch Apply Passage

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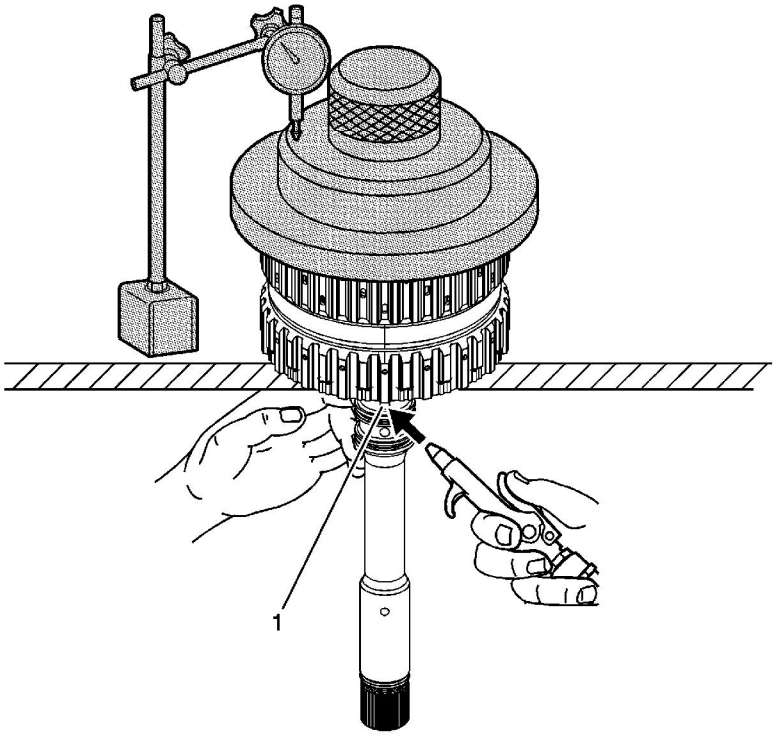
1	**Tip** Apply compressed air to the apply passage hole, and observe the dial indicator measurement. Refer to Clutch Backing Plate Retaining Ring Specifications .

4-5-6 Clutch Backing Plate Retaining Ring Measurement



Callout	Component Name
Preliminary Procedures 1. Install the clutch assembly into a hole in the workbench 2. Zero out the dial indicator on the DT 47868-1 . **Special Tools** • DT 47868-1 Pack Travel Weight • J 8001 Dial Indicator Set • J 26900-13 Magnetic Base	
1	4-5-6 Clutch Apply Passage **Tip** While using one finger to block the top passage hole on the turbine shaft, apply compressed air to the opposite top passage hole (1), and observe the dial indicator measurement. Refer to Clutch Backing Plate Retaining Ring Specifications .

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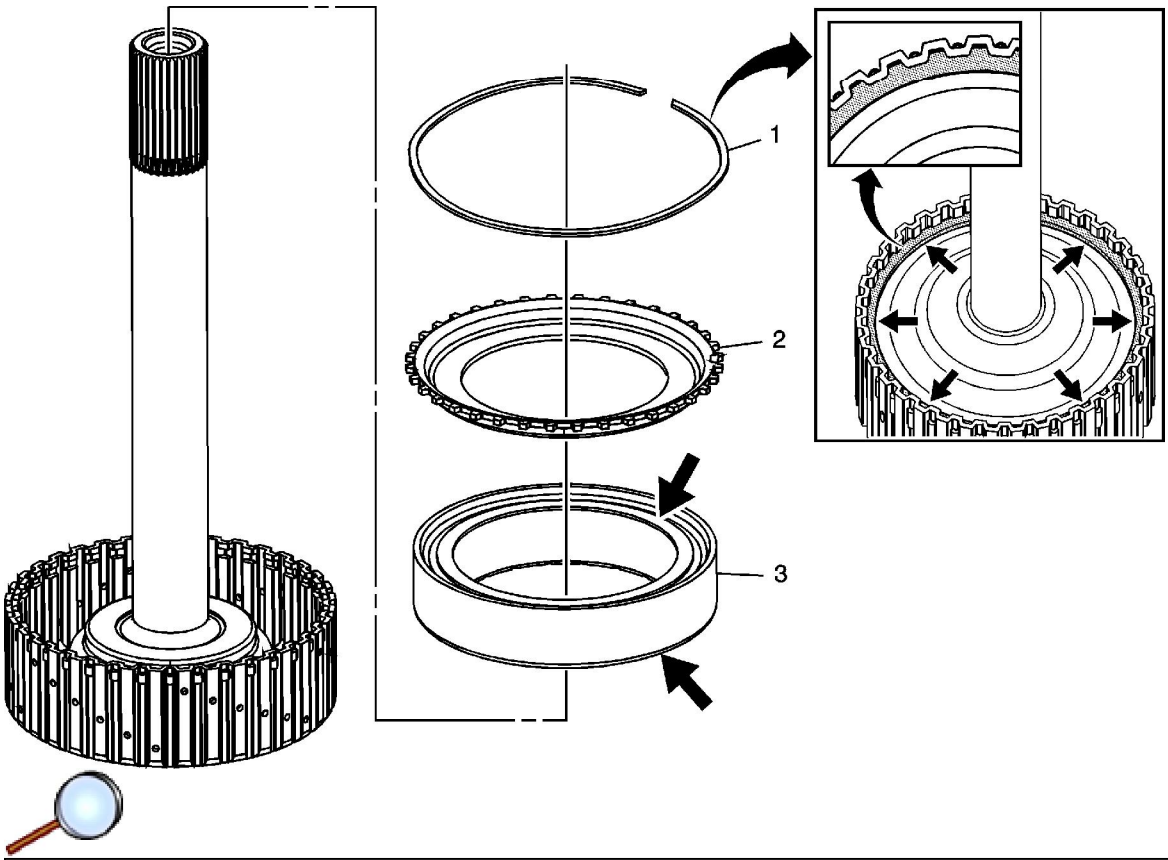
4-5-6 Clutch Dampener Overhaul



Callout	Component Name
1	4-5-6 Clutch Dampener Retaining Ring **Caution:** Ensure the retaining ring is installed with the tapered side up, and in the 9 o'clock position from the pan side of the case. Failure to properly install the retaining ring will cause transmission damage.
2	4-5-6 Clutch Dampener Apply Plate
3	4-5-6 Clutch Dampener **Tip** Dry and inspect the clutch dampener for the following conditions: • Pitting • Flaking • Delamination • Wear • Glazing • Cracking

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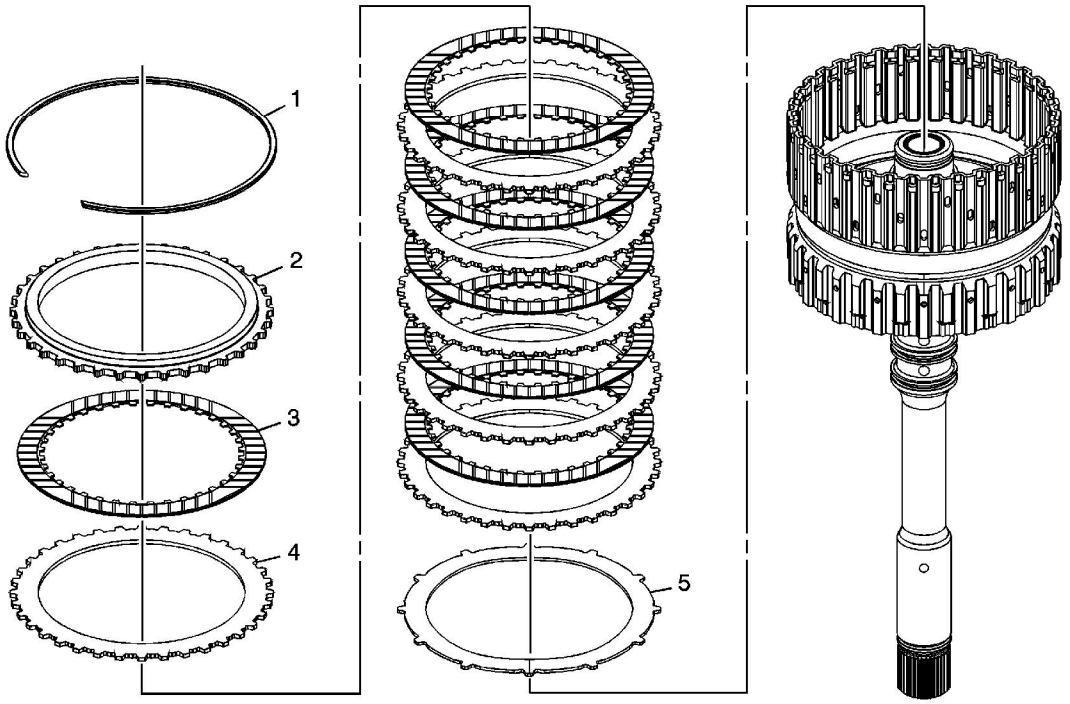
	If any of these conditions are found, replace the dampener.

4-5-6 Clutch Overhaul (6L80)

Table 1: 4-5-6 Clutch Plates Removal
Table 2: 4-5-6 Clutch Piston Removal
Table 3: Turbine Shaft Fluid Seal Ring Replacement
Table 4: 4-5-6 Clutch Piston Installation
Table 5: 4-5-6 Clutch Plates Installation

4-5-6 Clutch Plates Removal



4-5-6 Clutch Plates Removal

Callout	Component Name
1	4-5-6 Clutch Backing Plate Retaining Ring
2	4-5-6 Clutch Backing Plate
3	4-5-6 Clutch Plate Assembly (Qty: 6)
4	4-5-6 Clutch Plate (Qty: 6)
5	4-5-6 Clutch (Waved) Plate

4-5-6 Clutch Piston Removal

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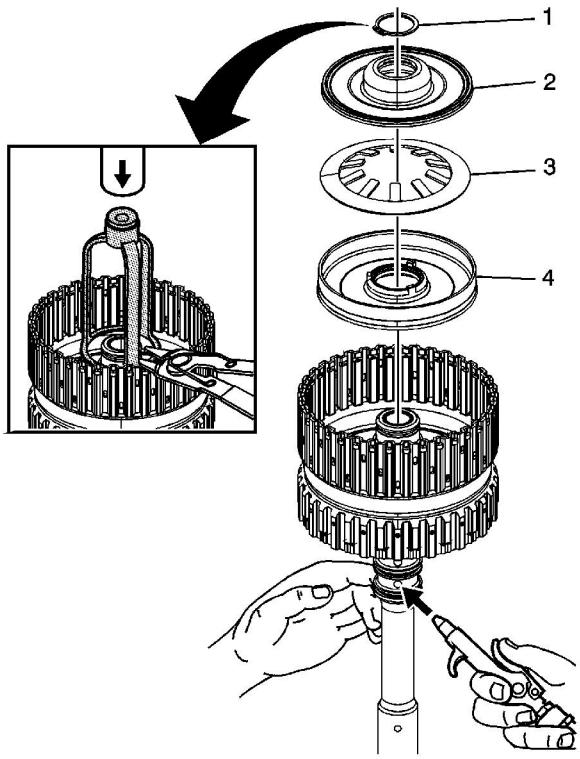
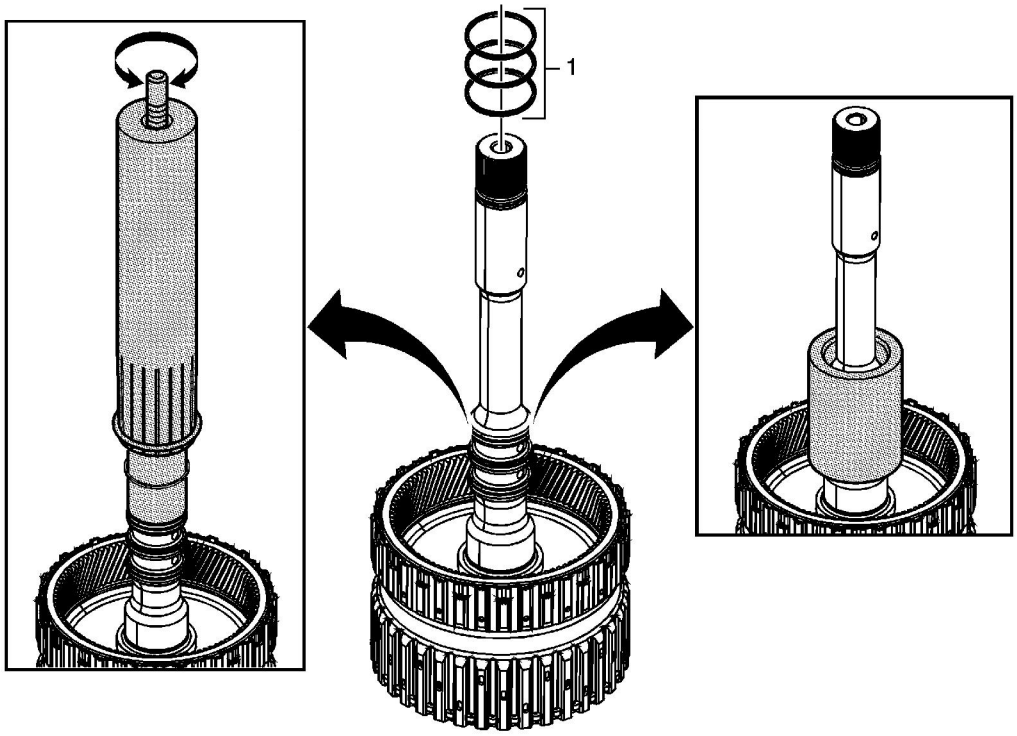


4-5-6 Clutch Piston Removal

Callout	Component Name
1	4-5-6 Clutch Piston Dam Retaining Ring **Caution:** Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. **Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Special Tool** J 43074 Clutch Spring Compressor
2	4-5-6 Clutch Piston Dam Assembly **Tip** It may be necessary to apply air pressure to remove the dam and piston.
3	4-5-6 Clutch Spring
4	4-5-6 Clutch Piston Assembly **Tip** It may be necessary to apply air pressure to remove the piston.

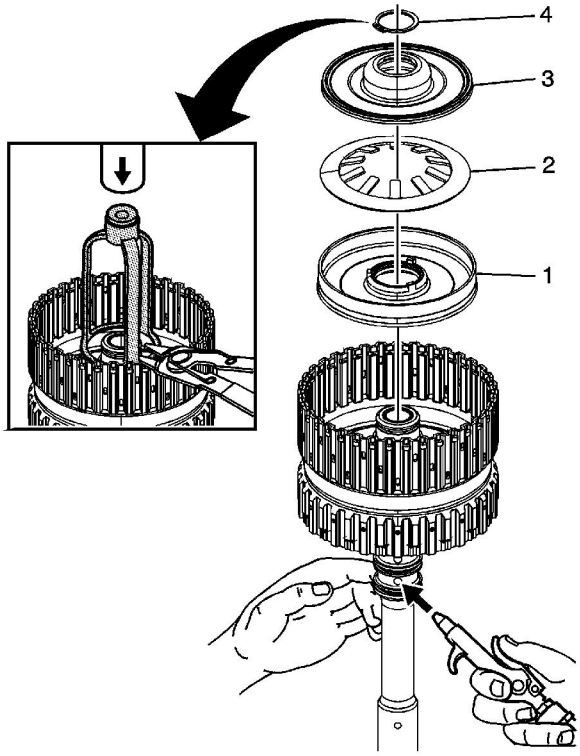
Turbine Shaft Fluid Seal Ring Replacement



Turbine Shaft Fluid Seal Ring Replacement

Callout	Component Name
Preliminary Procedures • Inspect the turbine shaft fluid passages and splines. • Clean any plugged passages.	
1	Turbine Shaft Fluid Seal Ring (Qty: 3) **Caution:** Do not use old seal rings. Install NEW seal rings. Reusing old seal rings may cause internal transmission leaks and transmission damage. **Caution:** Size the fluid seal rings for at least 5 minutes after installation to obtain proper seal ring size. Failure to do so may cause internal transmission leaks and transmission damage. **Tip** Adjust the turn screw on DT 47768-1 and install the bottom seal ring first. **Special Tools** • DT 47768-1 Seal Protector • DT 47768-2 Seal Pusher • DT 47768-3 Seal Sizer

4-5-6 Clutch Piston Installation

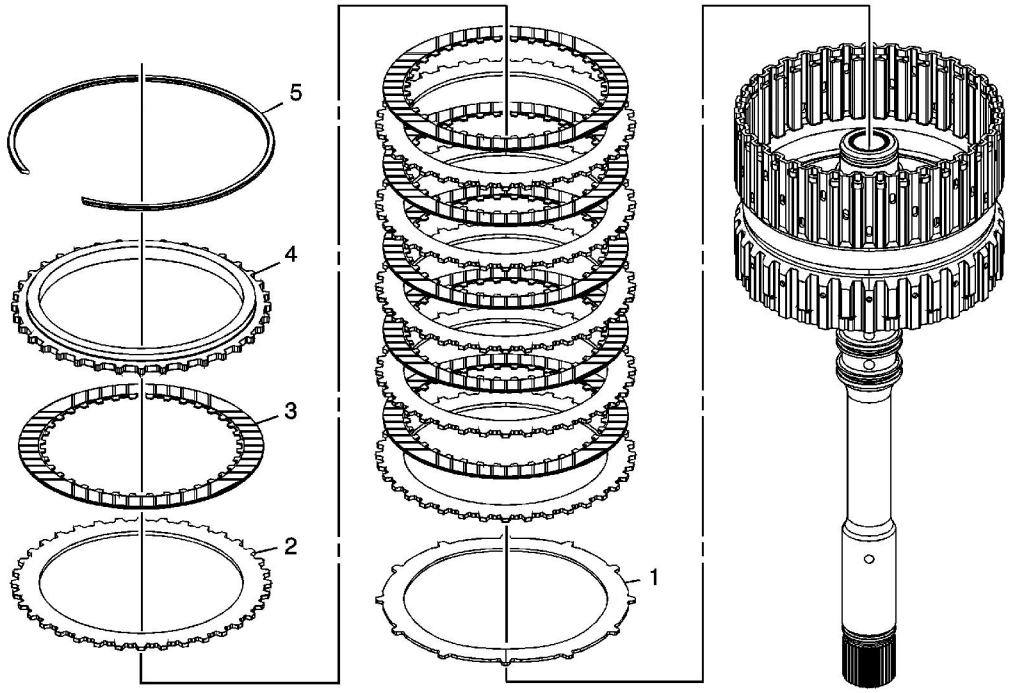


4-5-6 Clutch Piston Installation

Callout	Component Name
1	4-5-6 Clutch Piston Assembly
2	4-5-6 Clutch Spring **Caution:** Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
3	4-5-6 Clutch Piston Dam Assembly **Tip** Lubricate the inner and outer sealing surfaces of the dam assembly with automatic transmission fluid (ATF) in order to ease installation into the piston.
4	4-5-6 Clutch Piston Dam Retaining Ring **Caution:** Use care when compressing the 4-5-6 clutch piston assembly, spring and dam assembly. Compressing the dam assembly too much may damage it. **Caution:** Refer to Retaining Ring Reuse Caution in the Preface section. **Tip** Apply air to verify proper installation of all 4-5-6 clutch components. The piston should apply and release smoothly.

	Special Tool J 43074 Clutch Spring Compressor

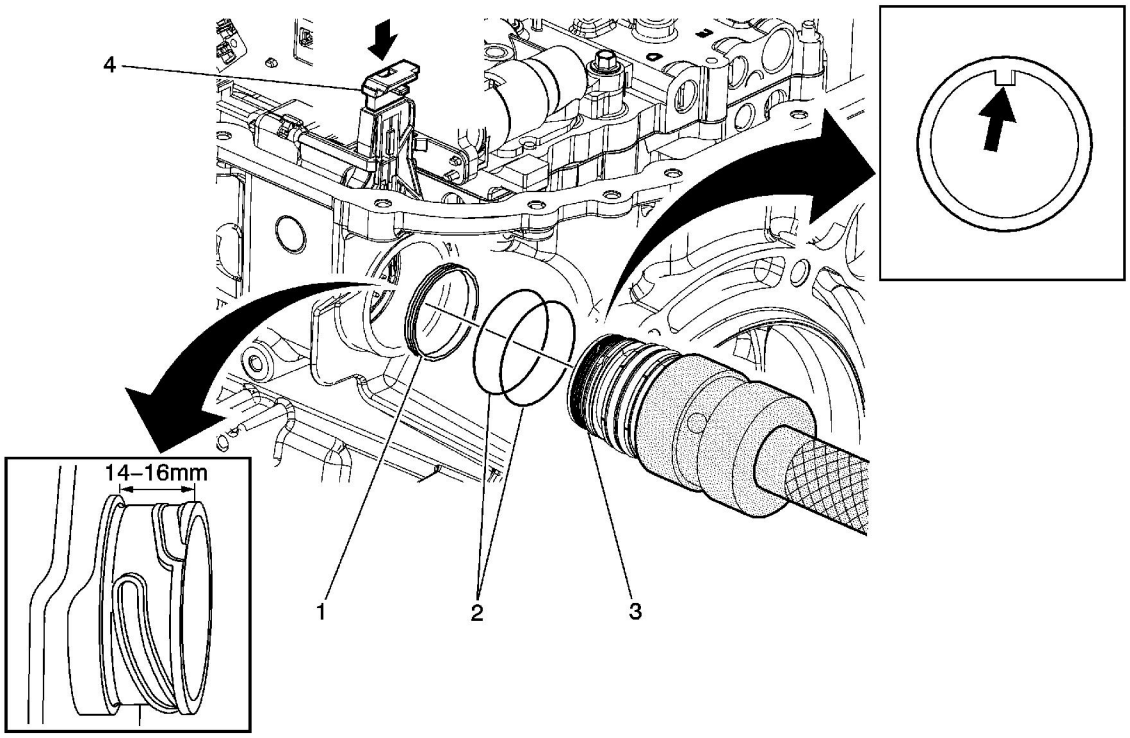
4-5-6 Clutch Plates Installation



4-5-6 Clutch Plates Installation

Callout	Component Name
1	4-5-6 Clutch (Waved) Plate
2	4-5-6 Clutch Plate (Qty: 6)
3	4-5-6 Clutch Plate Assembly (Qty: 6)
4	4-5-6 Clutch Backing Plate
5	4-5-6 Clutch Backing Plate Retaining Ring **Tip** After the retaining ring is installed, determine clutch piston travel in order to verify if the correct selective retaining ring is being used. Refer to 4-5-6 Clutch Backing Plate Retaining Ring Measurement.

Automatic Transmission Electrical Connector Passage Sleeve Installation



Callout	Component Name
1	NEW Lip Seal
2	NEW O-Ring Seals (Qty: 2)
3	Electrical Connector Passage Sleeve **Caution:** Orientate the alignment tab inside the passage sleeve with the slot in the electrical connector of the control solenoid valve assembly. Push the sleeve straight into the case bore and connector. Do NOT rotate the sleeve at any time. Ensure the sleeve is fully seated into the case. When the sleeve is properly installed, the distance from the case surface to the end of the sleeve should be 14-16 mm. Even though the correct electrical connections may still be maintained, failure to ensure proper installation of the sleeve may result in a fluid leak around the sleeve lip seal and into the sleeve cavity. **Specification** 14-16 mm **Special Tools**

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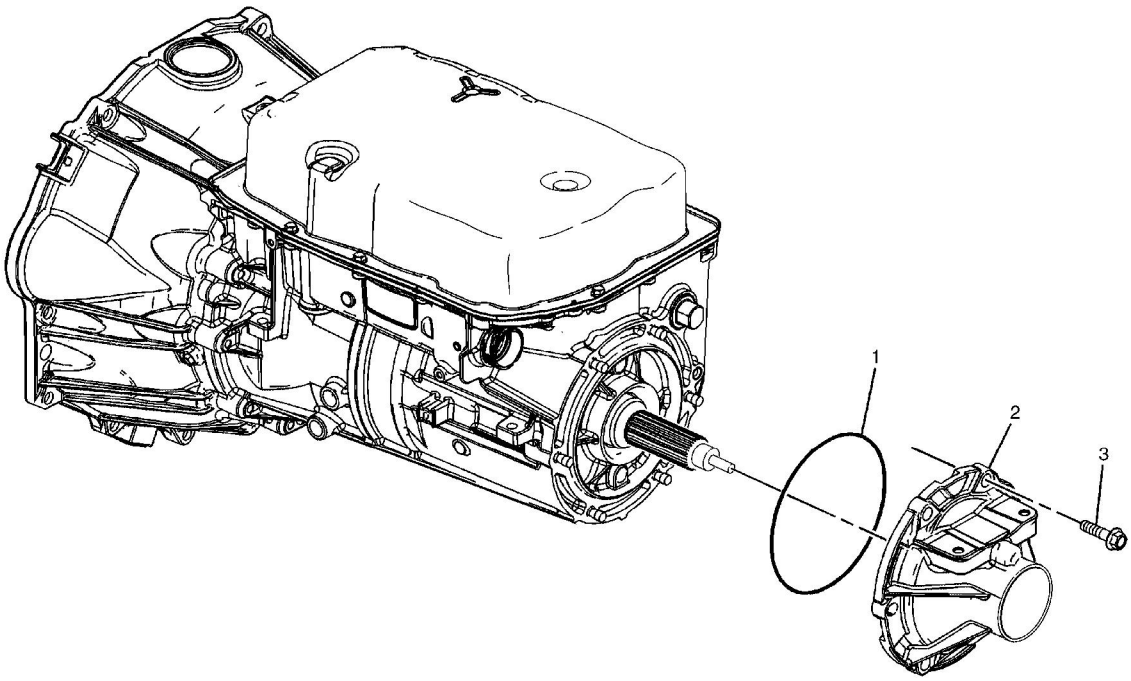
	• *DT 47715* Electrical Connector Passage Sleeve Remover/Installer • *J 42183* Driver Handle For equivalent regional tools, refer to Special Tools.
4	Electrical Connector Slide Lock **Tip** Push down on the electrical connector slide lock to ensure proper installation.

Case Extension Assembly Removal



Callout	Component Name
1	Bolt M10 x 40 (Quantity: 6)
2	Case Extension
3	Case Extension Seal

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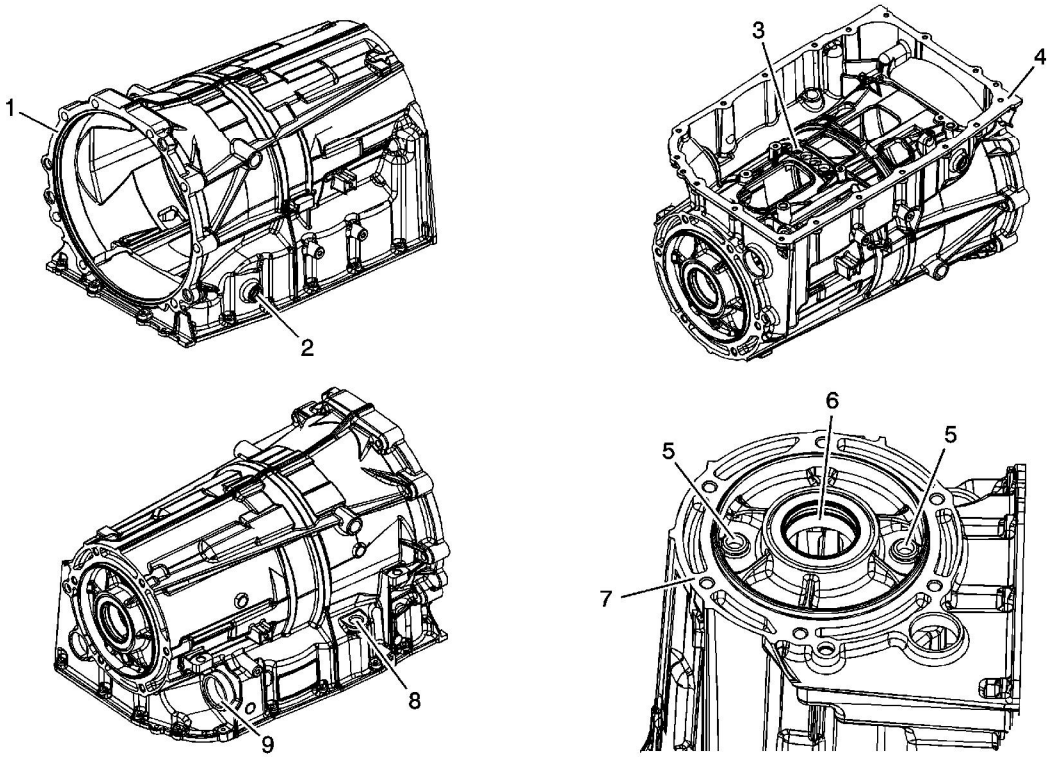
Case Inspection



Callout	Component Name
Caution: After cleaning the transmission components, allow to air dry. Do not use cloth or paper towels in order to dry any transmission components. Lint from the towels can cause component failure. **Caution:** Do not reuse cleaning solvents. Previously used solvents may deposit sediment which may damage the component. **Preliminary Procedures** 1. Thoroughly clean the transmission case assembly, including case threads, with clean solvent. 2. Clean gasket sealing surfaces. Remove all residual gasket material. 3. Inspect all threaded holes. If necessary, repair any thread damage.	
1	Front Case Sealing Surface
2	Manual Shift Shaft Seal **Tip** Refer to Manual Shift Shaft Seal Replacement.
3	Center Support Fluid Passage Seal Bores

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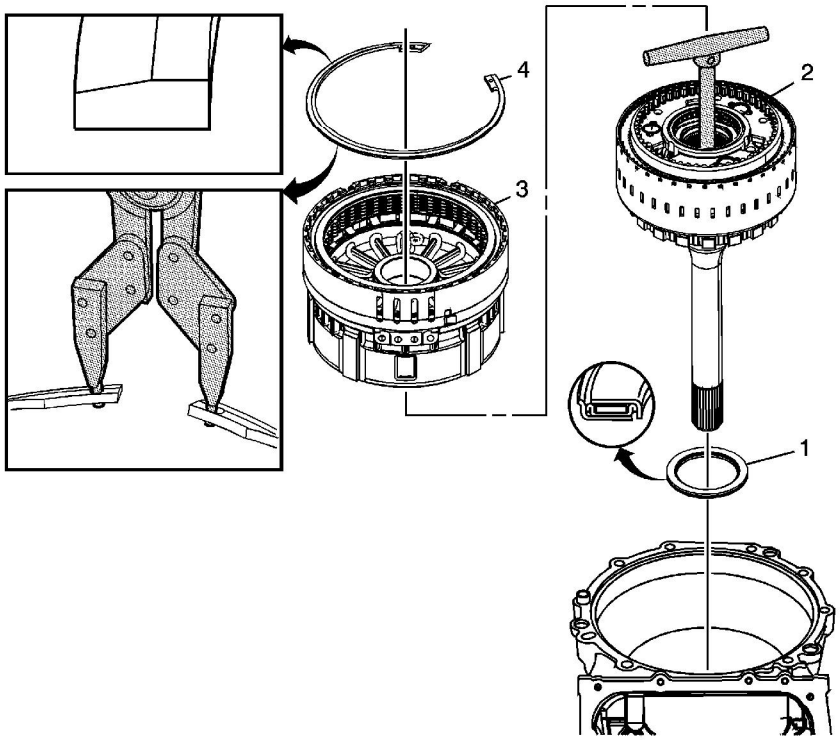
4	Fluid Pan Sealing Surface
5	Case Plugs
6	Output Shaft Bushing or Bearing (model specific)
7	Rear Case Sealing Surface
8	Fill Tube Bore
9	Electrical Connector Passage Sleeve Bore

Center Support, Output Carrier and Output Shaft Installation



Callout	Component Name
1	Output Shaft Thrust Bearing Assembly
2	Output Carrier Assembly and Output Shaft Assembly **Caution:** Apply automatic transmission fluid (ATF) to the inside diameter of the output shaft seal before installing the output shaft assembly into the case. Failure to lube the seal may cause the seal to roll during output shaft installation, which will result in transmission damage. **Caution:** Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage. **Special Tool** *DT 47786* Output Carrier/Shaft Lifting Tool For equivalent regional tools, refer to Special Tools.
	Center Support Assembly

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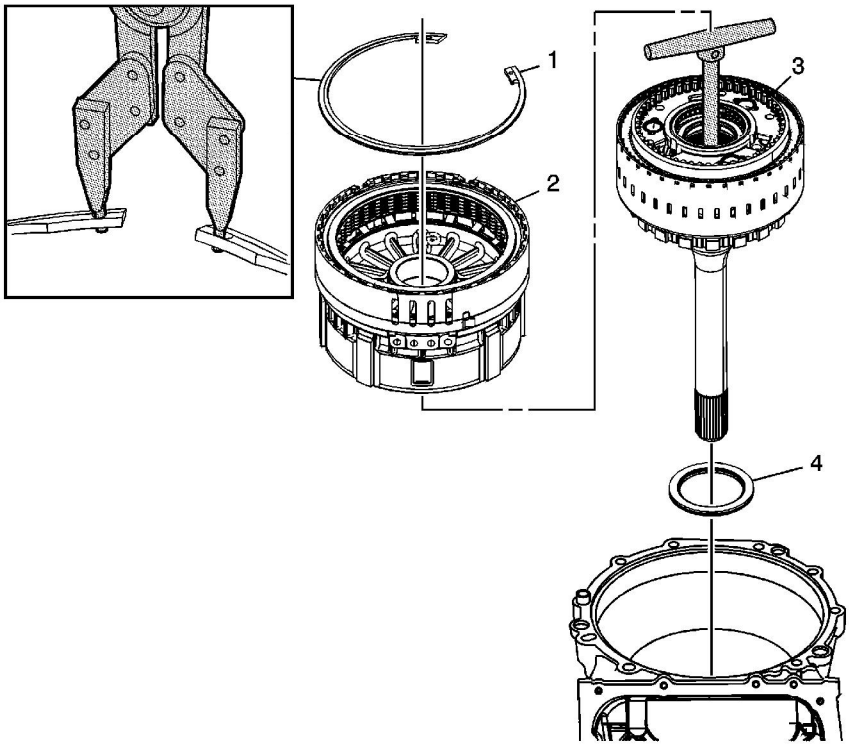
3	**Tip** • When the center support assembly is properly installed, the fluid passages should align with the fluid passage seal bores in the case assembly. • It may be necessary to rotate the output shaft by hand in order to fully install the center support assembly.
4	Center Support Retaining Ring **Warning:** Use care when removing or installing the retaining ring. Ensure the J 45126 and DT 47773 are installed properly onto the retaining ring or bodily injury may occur. **Caution:** Ensure the retaining ring is installed with the tapered side up, and in the 9 o'clock position from the pan side of the case. Failure to properly install the retaining ring will cause transmission damage. **Special Tools** • *DT 47773* Snap Ring Pliers Adapter Set • *J 45126* Snap Ring Pliers For equivalent regional tools, refer to Special Tools.

Center Support, Output Carrier and Output Shaft Removal



Callout	Component Name
1	Center Support Retaining Ring **Warning:** Use care when removing or installing the retaining ring. Ensure the J 45126 and DT 47773 are installed properly onto the retaining ring or bodily injury may occur. **Tip** To release tension on the retaining ring, place the retaining ring flat on the floor and step on it, then remove the tool. **Special Tools** • *DT 47773* Snap Ring Pliers Adapter Set • *J 45126* Snap Ring Pliers For equivalent regional tools, refer to Special Tools.
2	Center (with 2-6 Low and Reverse Clutch) Support Assembly

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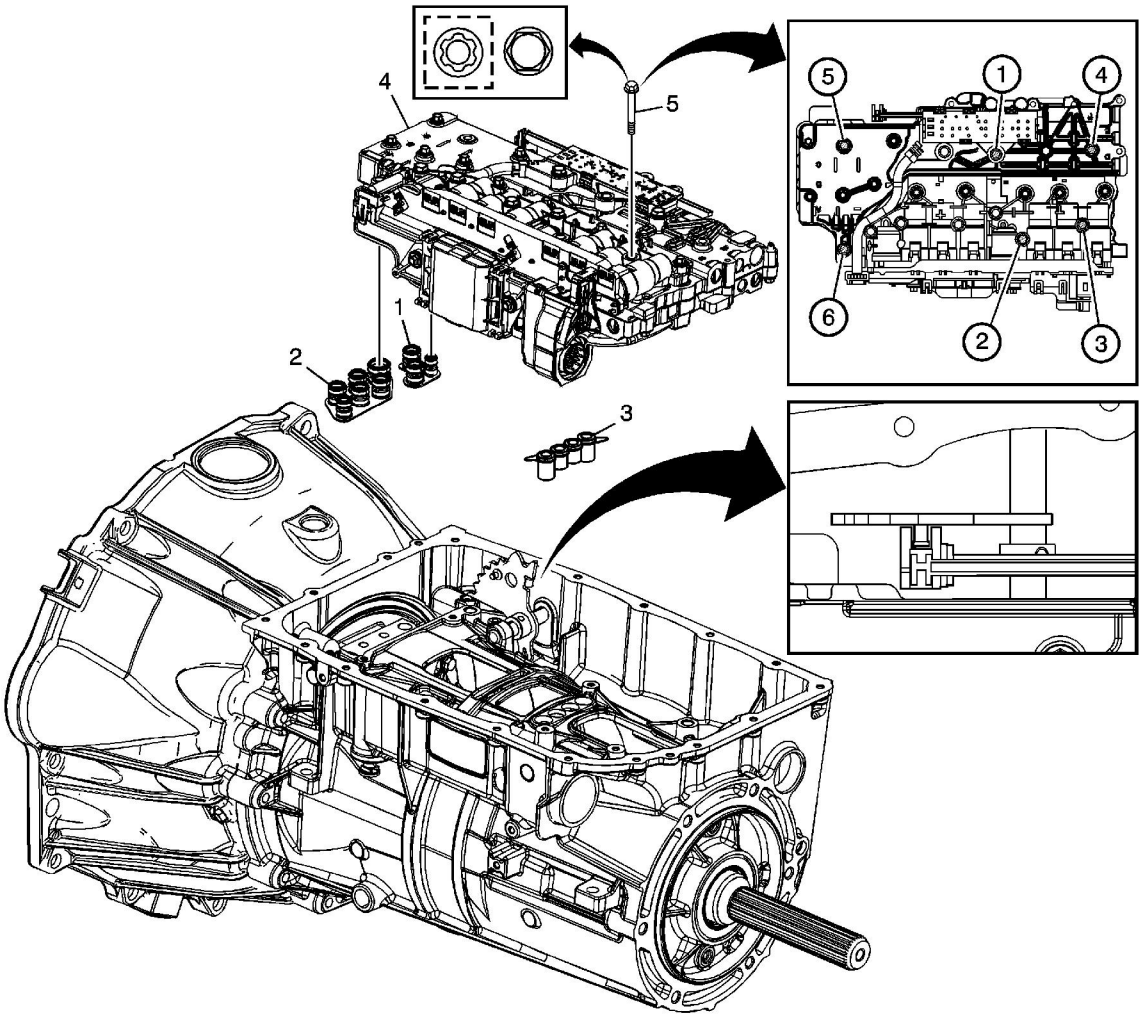
3	Output Carrier Assembly and Output Shaft Assembly **Caution:** Ensure the DT 47786 is completely threaded into the output shaft assembly. Due to the weight of the assembly, incomplete threading may cause the assembly to break free from the DT 47786, causing component damage. **Special Tool** *DT 47786* Output Carrier/Shaft Lifting Tool For equivalent regional tools, refer to Special Tools.
4	Output Shaft Thrust Bearing Assembly

Control Valve Body Assembly Removal



Callout	Component Name
1	Fluid Pump Seal Assembly
2	Fluid Pump Seal Assembly
3	Centre Support Fluid Passage Seal Assembly
4	Control Valve Body Assembly
5	Bolts M5 x 73 (Quantity: 6)

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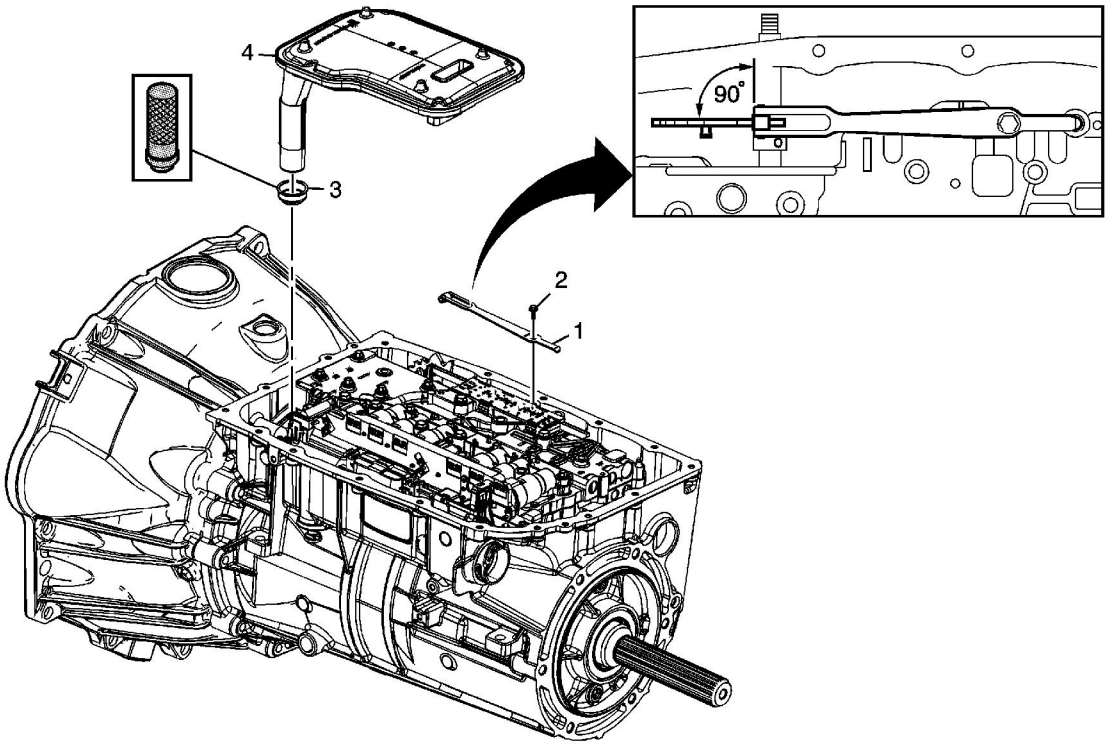
Fluid Filter and Manual Shift Detent Assembly Installation



Callout	Component Name
1	Manual Shaft Detent Assembly **Caution:** Ensure the manual shaft detent assembly roller is centered over the manual shaft detent lever assembly. Failure to center the roller may cause hard or no shift lever operation.
2	Bolt M6 x 14.5 **Caution:** Refer to Fastener Caution in the Preface section. **Tighten** 12 N·m (106 lb in).
3	NEW Fluid Filter Seal Assembly **Special Tools** • *DT 47848* Seal Installer • *J 42183* Driver Handle J 42183

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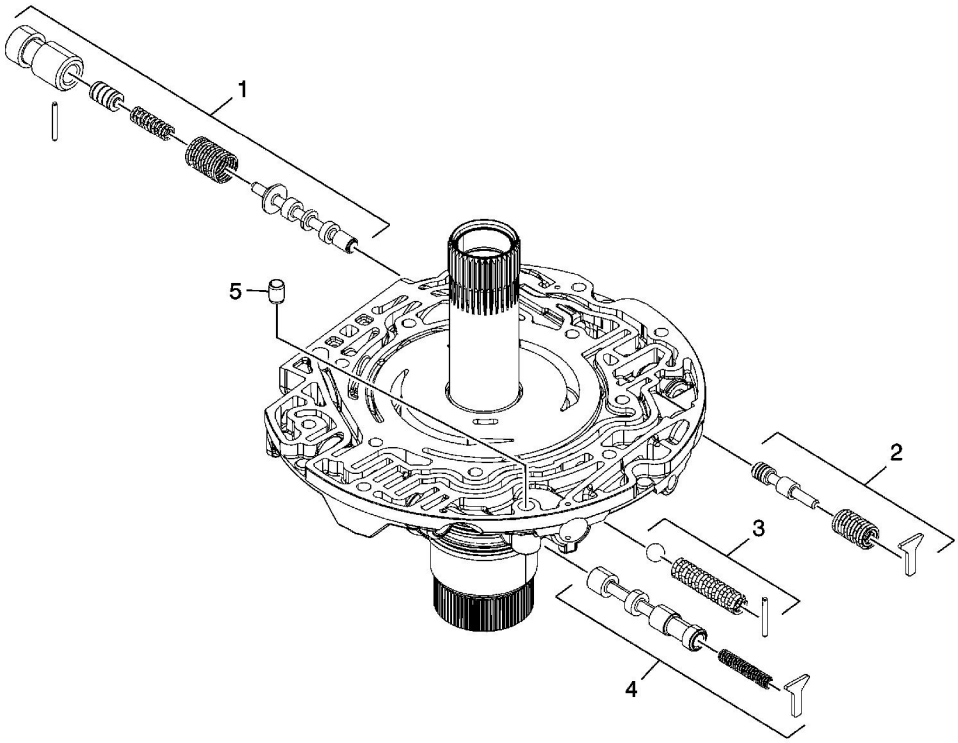
	For equivalent regional tools, refer to Special Tools.
4	NEW Fluid Filter Assembly

Fluid Pump Cover Cleaning and Inspection (6L80/6L90)



Callout	Component Name
Warning: Valve springs can be tightly compressed. Use care when removing retainers and plugs. Personal injury could result. **Preliminary Procedure** Clean and inspect all components and machined surfaces.	
1	Pressure Regulator Valve Train
2	Converter Feed Limit Valve Train
3	Pressure Relief Ball Valve and Spring
4	TCC Control Valve and Spring
5	A/Trans Fluid Pump Locator Pin

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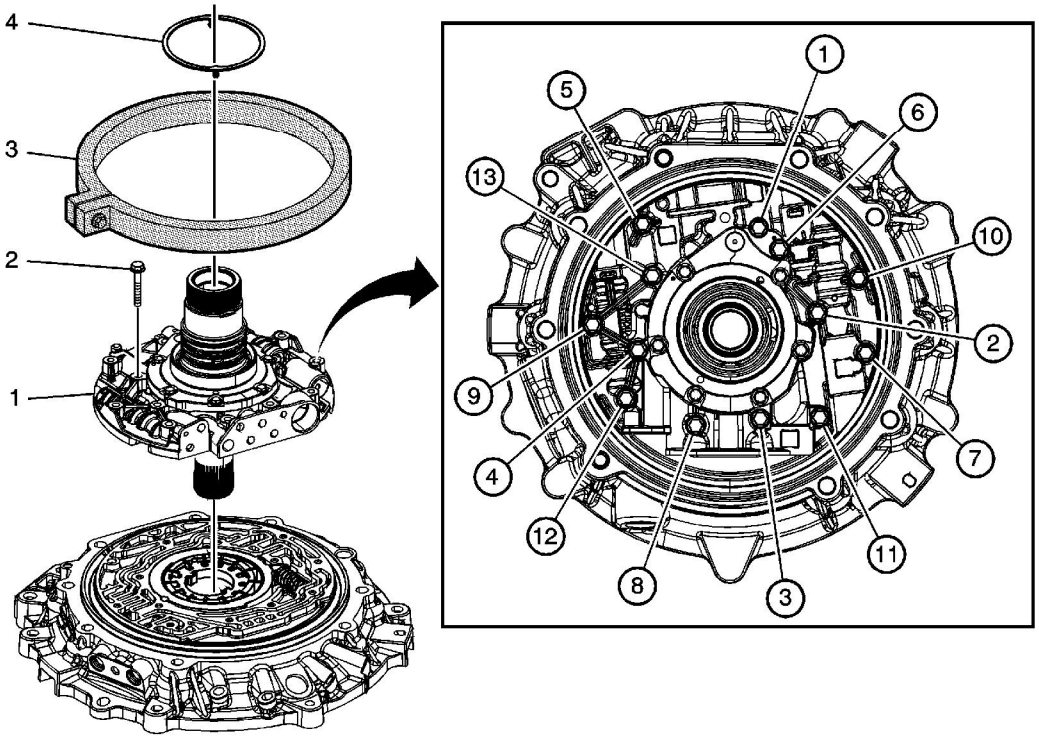
Fluid Pump Cover Installation



Callout	Component Name
1	Fluid Pump Cover Assembly
2	Fluid Pump Cover Bolts M6 x 40 (Quantity: 13) **Tip** Hand tighten only.
3	Alignment Tool and Bolt **Caution:** Refer to Fastener Caution in the Preface section. **Procedure** 1. Center the J 46664 around the fluid pump cover assembly in the 9 o'clock position and tighten the alignment bolt. 2. Tighten the fluid pump cover bolts in the sequence shown. **Tighten** 11 N·m (97 lb in) **Special Tool**

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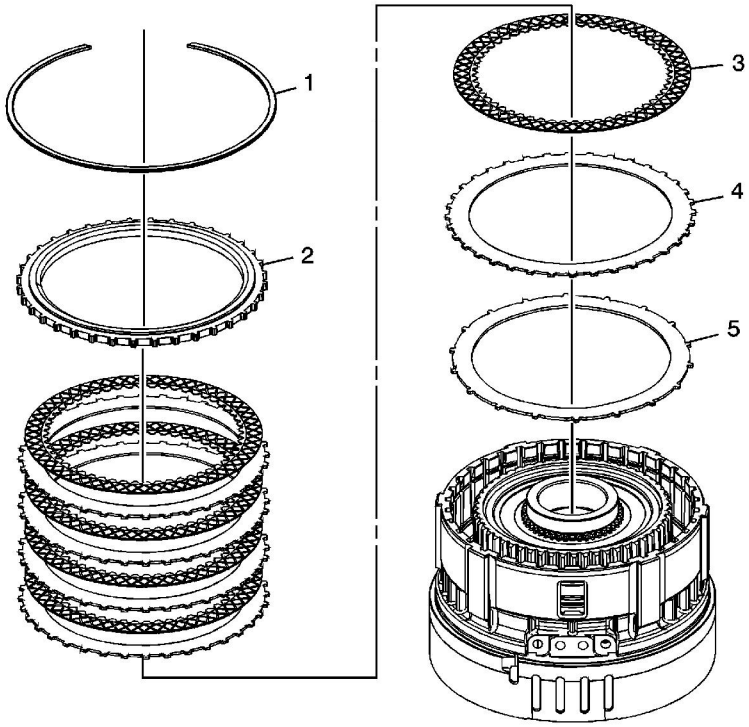
	J 46664 Pump Cover Alignment Tool
4	NEW 1-2-3-4 and 3-5 Reverse Clutch Housing Thrust Washer

Low and Reverse Clutch Overhaul

Table 1: Low and Reverse Clutch Plate Removal
Table 2: Low and Reverse Clutch Piston Removal
Table 3: Low and Reverse Clutch Piston Installation
Table 4: Low and Reverse Clutch Plate Installation

Low and Reverse Clutch Plate Removal



Low and Reverse Clutch Plate Removal

Callout	Component Name
1	Low and Reverse Clutch Backing Plate Retaining Ring
2	Low and Reverse Clutch Backing Plate
3	Low and Reverse Clutch Plate Assembly (Qty: 5)
4	Low and Reverse Clutch Plate (Qty: 5)
5	Low and Reverse Clutch (Waved) Plate

Low and Reverse Clutch Piston Removal

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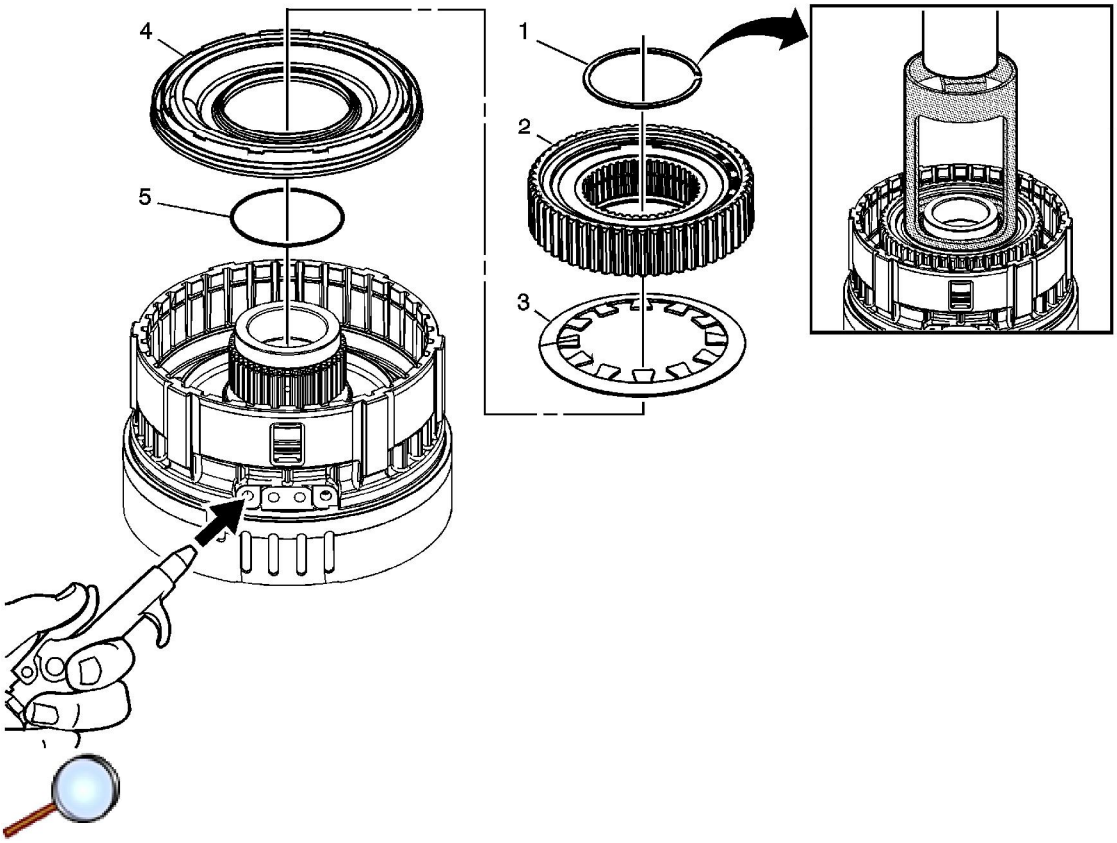
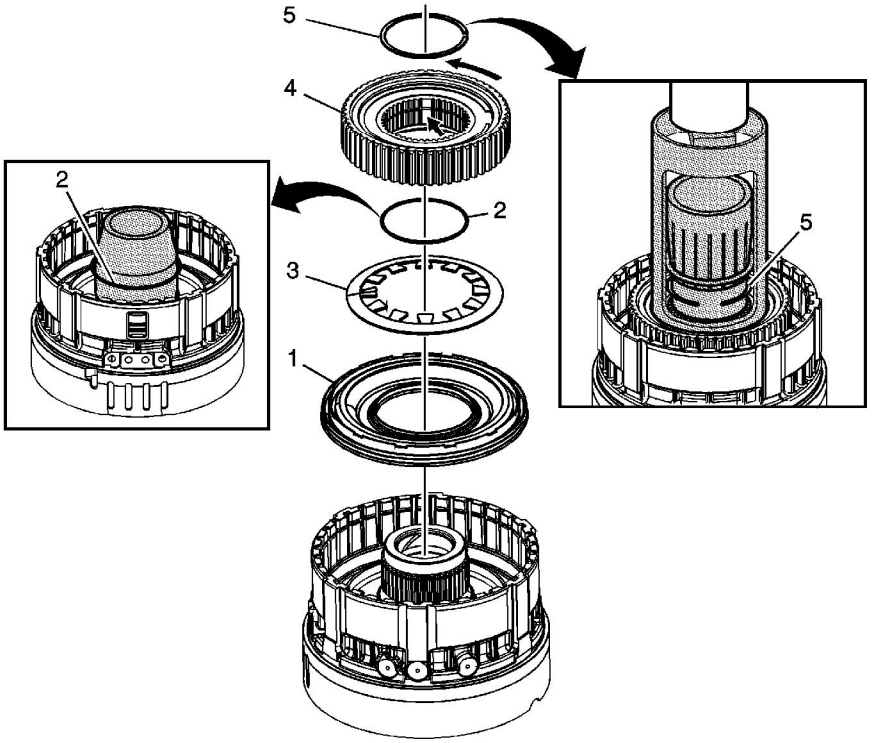


Low and Reverse Clutch Piston Removal

Callout	Component Name
1	Low and Reverse Clutch Spring Retaining Ring **Caution:** Ensure the DT 47779 contacts the sprag assembly and not the sprag retaining ring. Damage to the sprag may result. **Special Tool** DT 47779 Clutch Spring Compressor
2	Low Clutch Sprag Assembly
3	Low and Reverse Clutch Spring
4	Low and Reverse Clutch Piston Assembly **Tip** It may be necessary to apply air to the apply passage in order to unseat the piston.
5	Low Clutch Sprag Seal **Caution:** Refer to Seal Reuse Caution in the Preface section.

Low and Reverse Clutch Piston Installation

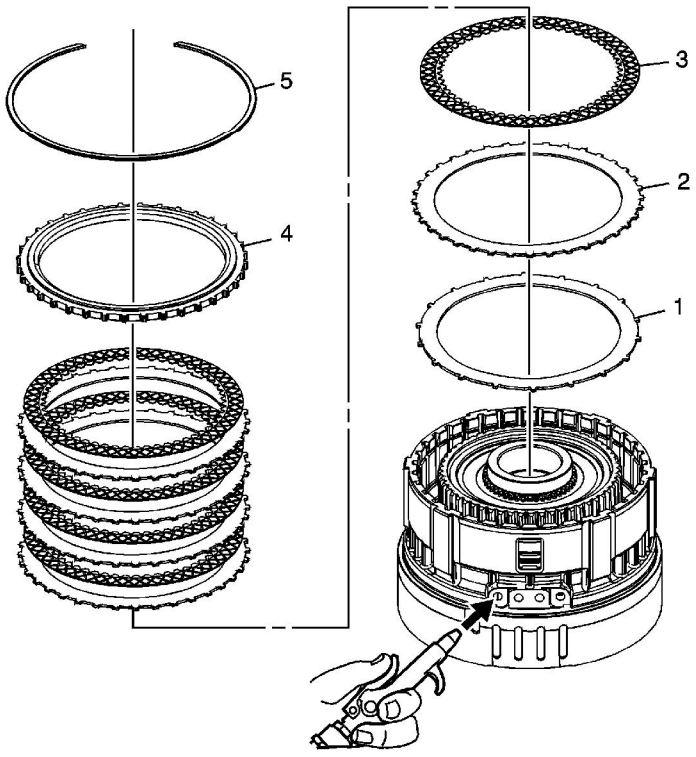


Low and Reverse Clutch Piston Installation

Callout	Component Name
1	Low and Reverse Clutch Piston Assembly **Tip** Lubricate the inner and outer sealing surfaces of the piston assembly with automatic transmission fluid (ATF) in order to ease installation into the center support assembly.
2	Low Clutch Sprag Seal **Caution:** Refer to Seal Reuse Caution in the Preface section. **Tip** Apply ATF to the DT 47780 to ease seal installation. **Special Tool** DT 47780 Low Clutch Sprag Seal Cone
3	Low and Reverse Clutch Spring **Notice:** Ensure the spring tabs are facing up during installation. Failure to do so may cause damage to the clutch assembly.
	Low Clutch Sprag Assembly **Tip**

4	• Verify that the low clutch sprag is operating correctly. Refer to the illustration for proper freewheel direction. • Ensure the missing splines on the sprag assembly are aligned with the missing splines on the center support hub.
5	Low and Reverse Clutch Spring Retaining Ring **Caution:** Ensure the DT 47779 contacts the sprag assembly and not the sprag retaining ring. Damage to the sprag may result. **Caution:** The retaining ring gap must be aligned with the 3 missing splines on the center support hub. Failure to do so may cause damage to the clutch assembly. **Special Tools** • DT 47778-1 Low Clutch Sprag Retaining Ring Cone • DT 47778-2 Low Clutch Sprag Retaining Ring Pusher • DT 47779 Clutch Spring Compressor

Low and Reverse Clutch Plate Installation

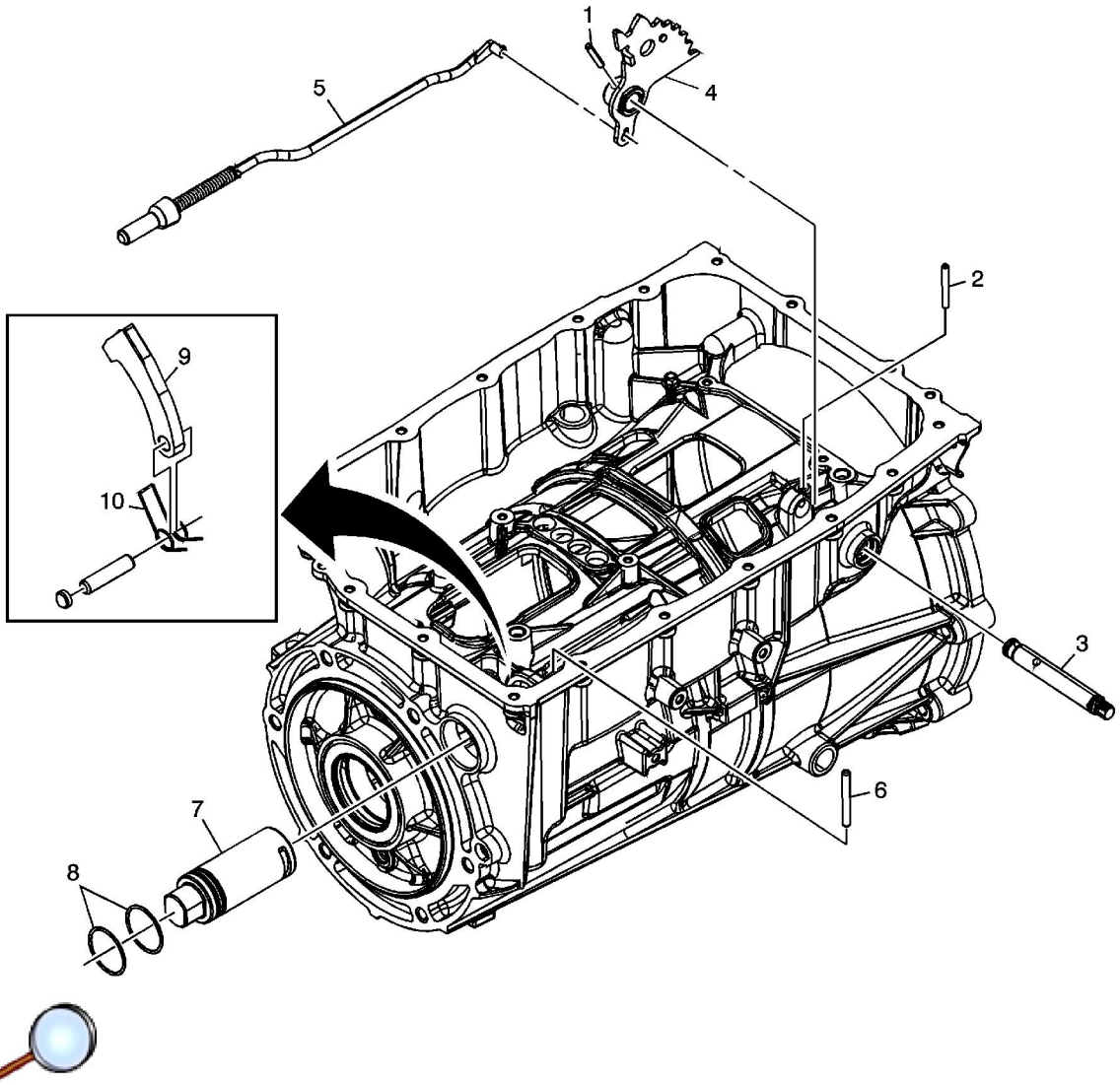


Low and Reverse Clutch Plate Installation

Callout	Component Name
1	Low and Reverse Clutch (Waved) Plate

2	Low and Reverse Clutch Plate (Qty: 5)
3	Low and Reverse Clutch Plate Assembly (Qty: 5)
4	Low and Reverse Clutch Backing Plate
5	Low and Reverse Clutch Backing Plate Retaining Ring **Tip** Apply air to verify proper installation of all low and reverse clutch components.

Manual Shift Shaft and Parking System Components Overhaul



Callout	Component Name
1	Manual Shaft Detent Lever Hub Pin **Note:** Discard the pin. Replace with NEW pin.
2	Manual Shift Shaft Pin **Note:** Discard the pin. Replace with NEW pin.
3	Manual Shift Shaft **Note:** Ensure the manual shift shaft seal is replaced before installing the shaft.
4	Manual Shaft Detent Lever Assembly

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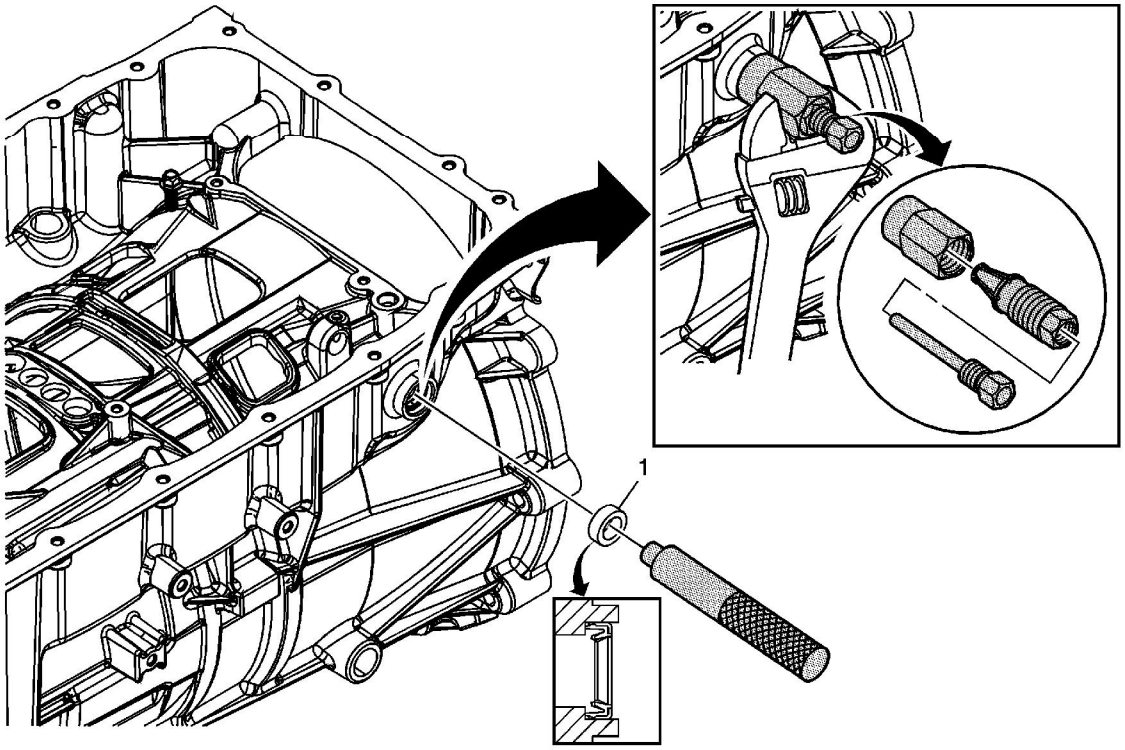
5	Park Pawl Actuator Assembly
6	Park Pawl Actuator Guide Pin **Note:** Discard the pin. Replace with NEW pin. **Tip** Use a large pair of side cutters to "walk" the pin out.
7	Park Pawl Actuator Guide
8	Park Pawl Actuator Guide (O-ring) Seals **Note:** Discard seals. Replace with NEW seals.
9	Park Pawl **Note:** Inspect for damage only. Do not remove. The park pawl is not a serviceable component.
10	Park Pawl Spring **Note:** Inspect for damage only. Do not remove. The park pawl spring is not a serviceable component.

Manual Shift Shaft Seal Replacement



Callout	Component Procedure
1	Manual Shift Shaft Seal **Caution:** Do not damage the case bore during removal of the manual shift shaft seal. **Caution:** When installing the seal, ensure the seal lip is firmly seated against the case bore surface. Do not allow the seal lip to be crushed, or a leak may result. **Caution:** Refer to Seal Reuse Caution in the Preface section. **Special Tools** • *DT 47770* Seal Installer • *J 45201* Cooler Line Seal Remover For equivalent regional tools, refer to Special Tools.

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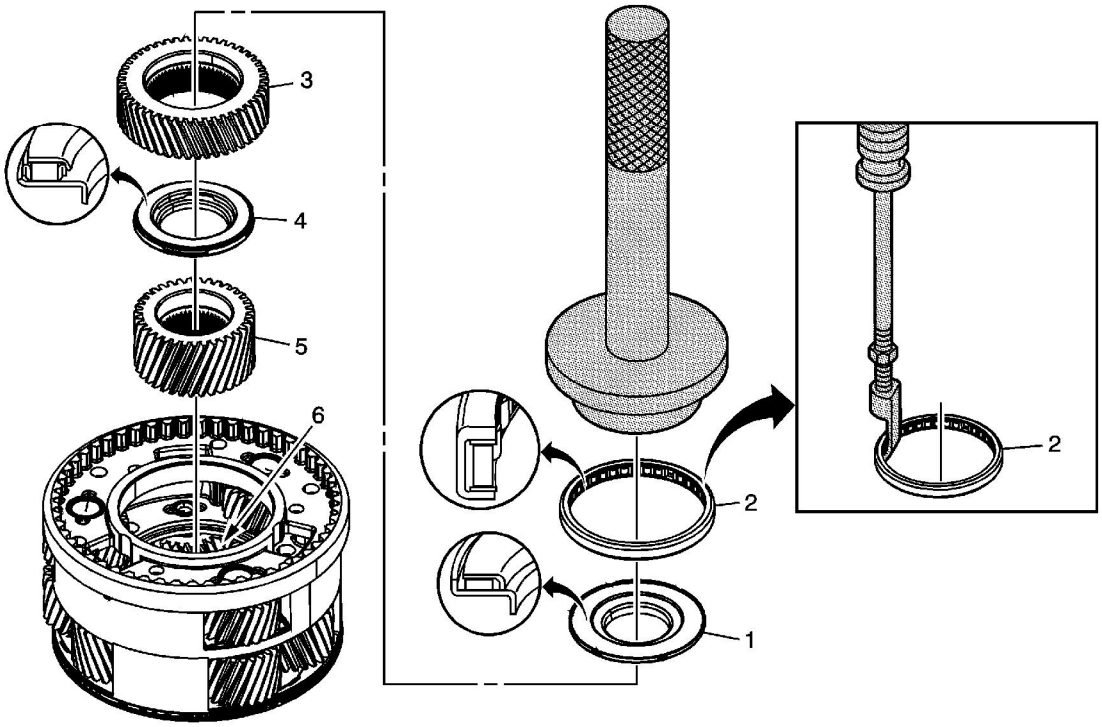
Output Carrier Assembly Overhaul (6L80)



Callout	Component Name
1	Output Carrier Front Sun Gear Thrust Bearing Assembly
2	Center Support Roller Bearing **Caution:** Do not reuse the center support roller bearing. Install a NEW center support roller bearing. Reusing an old bearing may result in damage to the output carrier. **Tip** The thick side of the bearing shell faces up. **Special Tools** • *DT 47857* Bearing Installer • *J 6125-B* Slide Hammer • *J 8092* Driver Handle • *J 23129* Universal Seal Remover For equivalent regional tools, refer to Special Tools.

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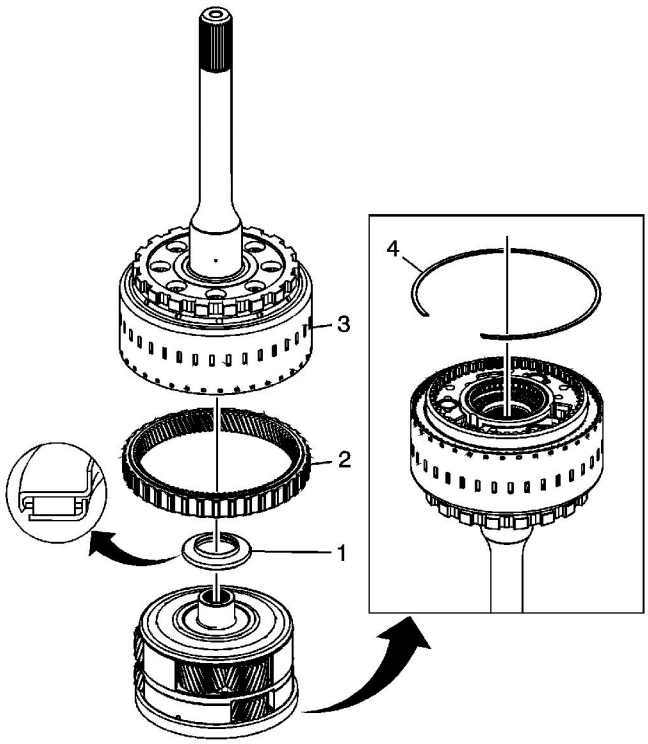
3	Output Carrier Front Sun Gear **Caution:** Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
4	Output Carrier Front Sun Gear Rear Thrust Bearing Assembly
5	Output Carrier Rear Sun Gear **Caution:** Install the gear chamfer side up. Failure to install the gear chamfer side up may result in transmission damage.
6	Output Carrier Rear Sun Gear Bearing Assembly **Tip** Inspect for damage only. Do not remove. The bearing assembly is not a serviceable component.

Output Carrier to Output Shaft Assemble



Callout	Component Name
1	Output Carrier Thrust Bearing Assembly
2	Output Carrier Internal Front Gear **Caution:** Install the gear flat side down. Failure to install the gear flat side down may result in transmission damage.
3	Output Shaft Assembly
4	Output Carrier Internal Gear Retaining Ring **Tip** Grasp the output shaft and carrier with both hands to turn over.

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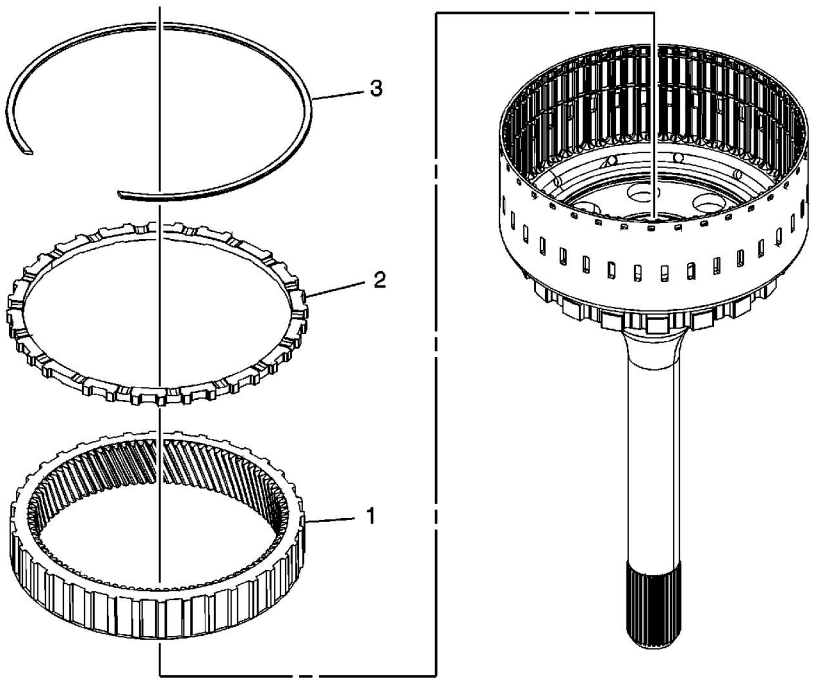
Output Shaft Assemble



Callout	Component Name
1	Output Carrier Internal Rear Gear **Caution:** Install the gear chamfer side down. Failure to install the gear chamfer side down may result in transmission damage.
2	Output Gear Internal Gear Spacer
3	Output Carrier Internal Gear Retaining Ring **Tip** Do not install the output carrier internal front gear and retaining ring yet. These components will be installed during assembly of the output carrier to the output shaft.

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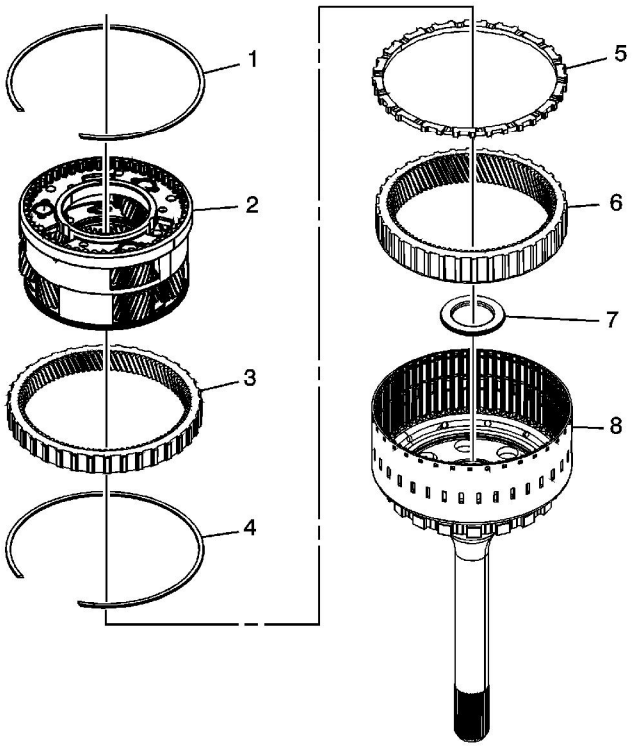
Output Shaft Disassemble



Callout	Component Name
Tip Inspect each component and replace as necessary.	
1	Output Carrier Internal Gear Retaining Ring
2	Output Carrier Assembly
3	Output Carrier Internal Front Gear
4	Output Carrier Internal Gear Retaining Ring
5	Output Carrier Internal Gear Spacer
6	Output Carrier Internal Rear Gear
7	Output Carrier Thrust Bearing Assembly
8	Output Shaft Assembly

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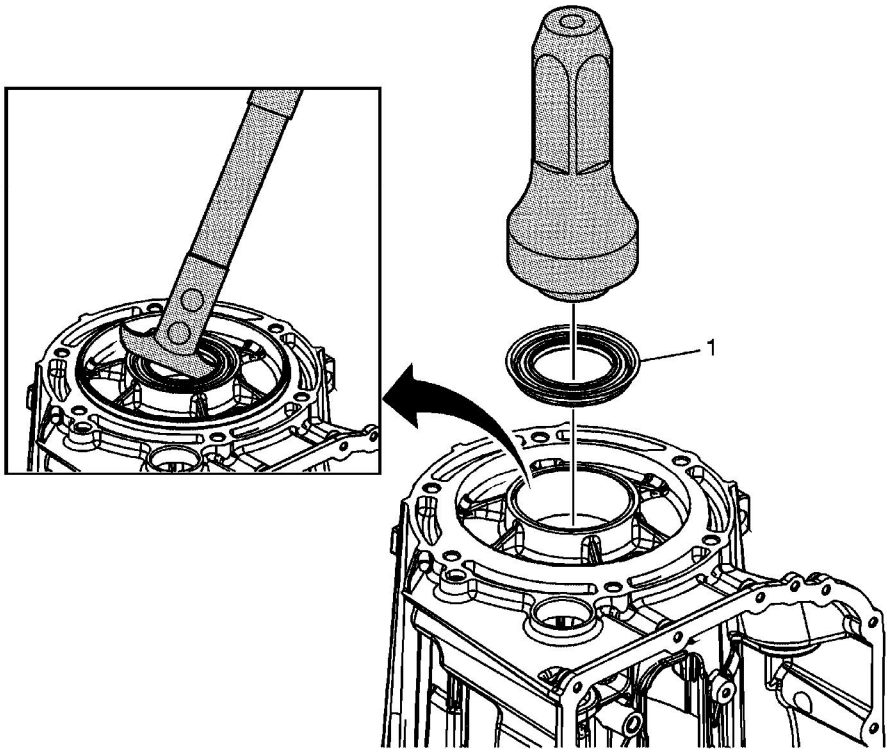
Output Shaft Seal Replacement



Callout	Component Name
1	Output Shaft Seal **Caution:** Do not reuse the seals. Replace with NEW seals. Reusing old seals may cause transmission damage. **Special Tools** • J 38693 . • J 45000 .

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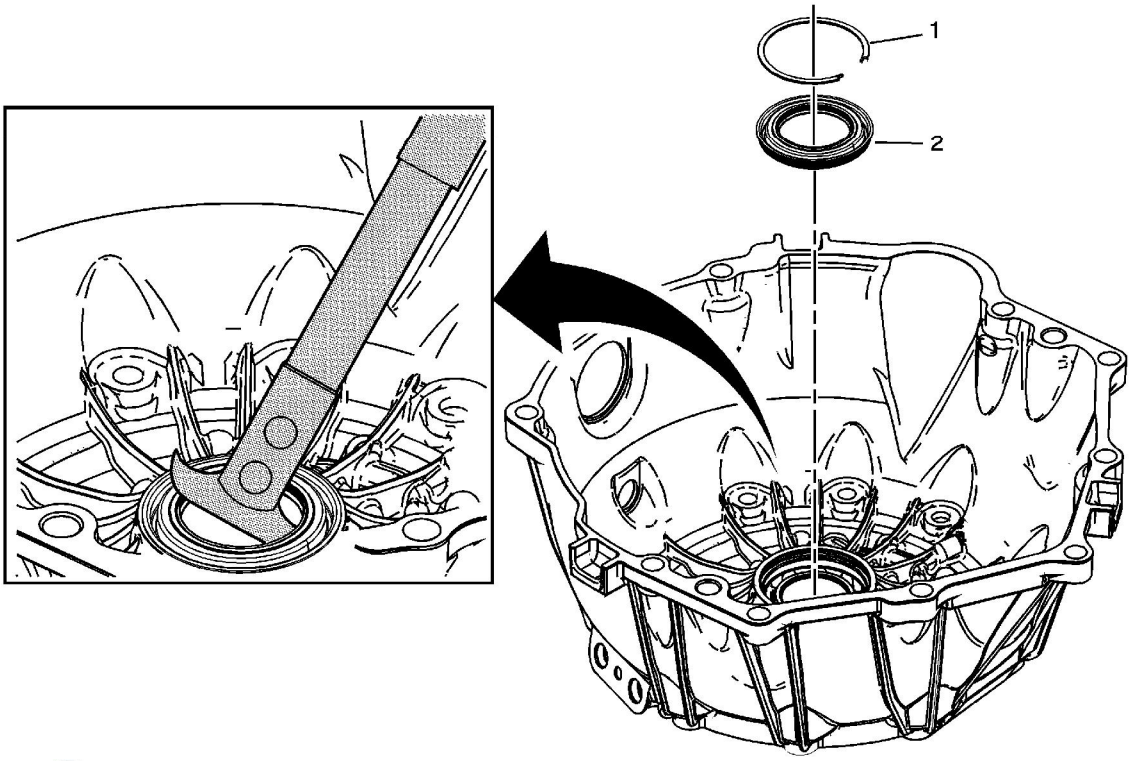
Torque Converter Fluid Seal Replacement



Callout	Component Name
1	Torque Converter Fluid Seal Retaining Ring
2	Torque Converter Fluid Seal Assembly. **Special Tool** J 45000 Seal Remover

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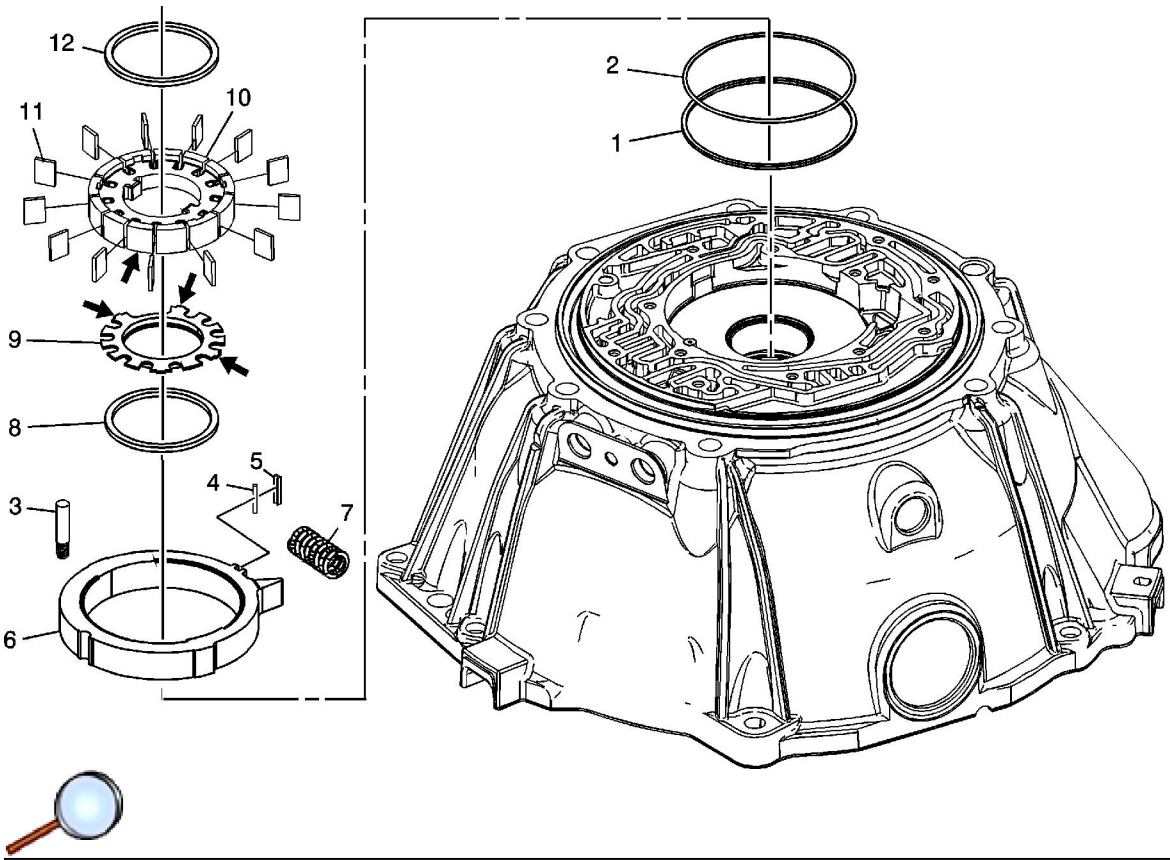
Torque Converter Housing with Fluid Pump Assemble



Callout	Component Name
1	Fluid Pump Slide Fluid Seal Ring
2	Fluid Pump Slide (O-Ring) Seal
3	Fluid Pump Slide Pivot Pin
4	Fluid Pump Slide Seal Support **Tip** The seal support is circular. The seal is rectangular.
5	Slide Seal
6	Fluid Pump Slide **Tip** If installing a NEW pump slide into the torque converter housing, ensure to properly select the correct rotor and slide before performing this procedure. Refer to Fluid Pump Selective Measurement and Fluid Pump Selective Specifications.
7	Fluid Pump Slide Outer Spring
8	Fluid Pump Vane Ring
9	Fluid Pump Rotor Guide

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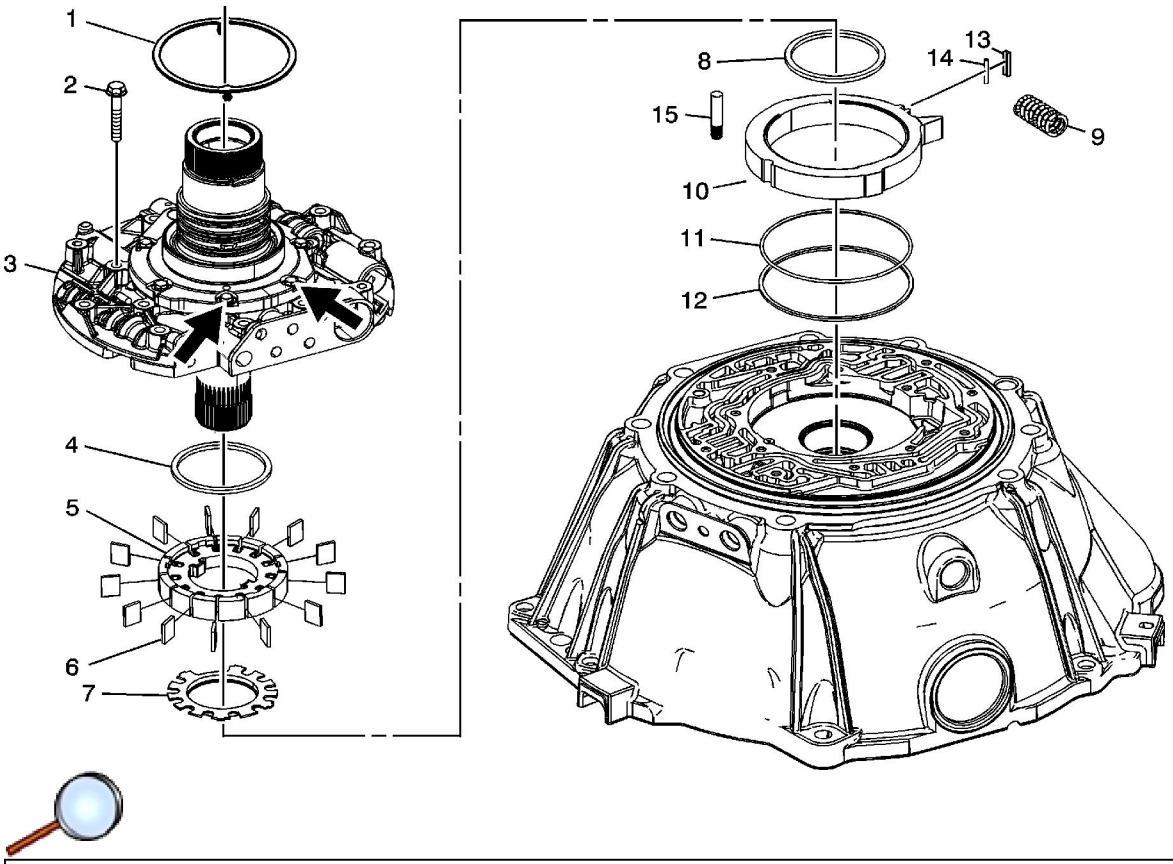
	Caution: Align the rotor guide tabs to the notches on the bottom of the rotor. Failure to do so may cause transmission damage.
10	Fluid Pump Rotor **Tip** If installing a NEW pump rotor into the torque converter housing, ensure to properly select the correct rotor and slide before performing this procedure. Refer to Fluid Pump Selective Measurement and Fluid Pump Selective Specifications.
11	Fluid Pump Vanes (Qty: 13)
12	Fluid Pump Vane Ring

Torque Converter Housing with Fluid Pump Disassemble



Callout	Component Name
Caution: Do not loosen or remove the 6 bolts securing the clutch support to the pump cover assembly. These bolts have been installed and torqued only after specific clutch support rotational requirements have been met. If the clutch support is not installed properly, damage to the transmission will occur.	
1	1-2-3-4 and 3-5 Reverse Clutch Housing Thrust Washer
2	Bolt M6 x 40 (Qty: 13)
3	Fluid Pump Cover Assembly
4	Fluid Pump Vane Ring
5	Fluid Pump Rotor
6	Fluid Pump Vanes (Qty: 13)
7	Fluid Pump Rotor Guide
8	Fluid Pump Vane Ring
9	Fluid Pump Slide Outer Spring
10	Fluid Pump Slide
11	Fluid Pump Slide (O-Ring) Seal

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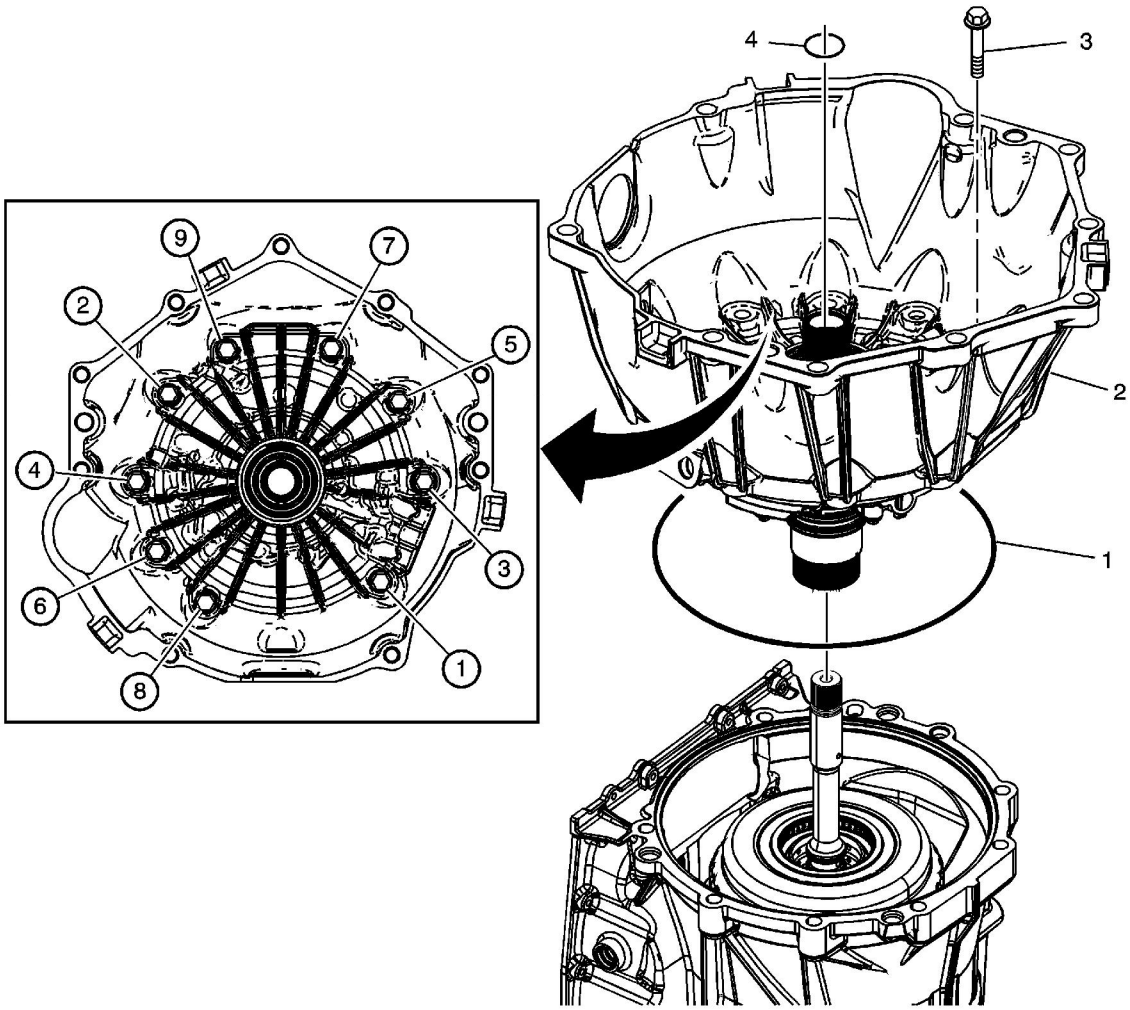
12	Fluid Pump Slide Fluid Seal Ring
13	Fluid Pump Slide Seal
14	Fluid Pump Slide Seal Support
15	Fluid Pump Slide Pivot Pin

Torque Converter Housing with Fluid Pump Installation



Callout	Component Name
1	NEW Fluid Pump Seal
2	Torque Converter (with Fluid Pump) Housing Assembly **Caution:** Ensure the turbine shaft (O-ring) seal is not installed prior to installing the torque converter housing assembly. The seal may become cut or damaged during installation of the torque converter housing assembly.
3	Bolts M10 x 50 (Qty: 9) **Caution:** Refer to Fastener Caution in the Preface section. **Procedure**

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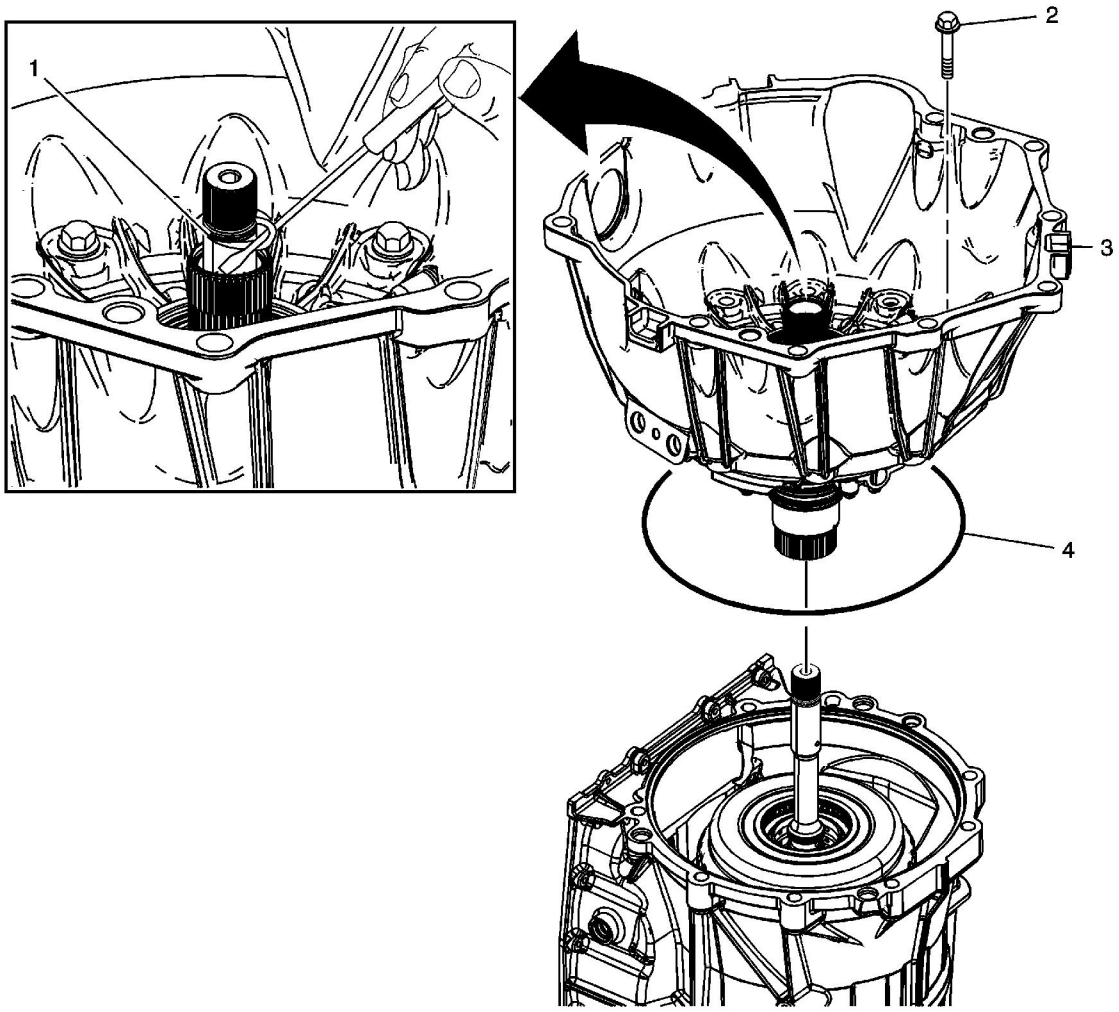
	Tighten in the sequence shown. **Tighten** 72 N·m (53 lb ft)
4	NEW Turbine Shaft (O-Ring) Seal

Torque Converter Housing with Fluid Pump Removal



Callout	Component Name
Caution: The valve body assembly must be removed prior to removing the torque converter (with fluid pump) housing assembly. Failure to ensure this will cause severe damage to both fluid pump seal assemblies. Also, the load of the valve body pushing on the seals, which in turn push on the pump, may prevent proper pump installation into the case. Refer to control valve body assembly removal.	
1	Turbine Shaft (O-ring) Seal
2	Bolt M10 x 50 (Qty: 9)
3	Torque Converter (With Fluid Pump) Housing Assembly
4	Fluid Pump Seal

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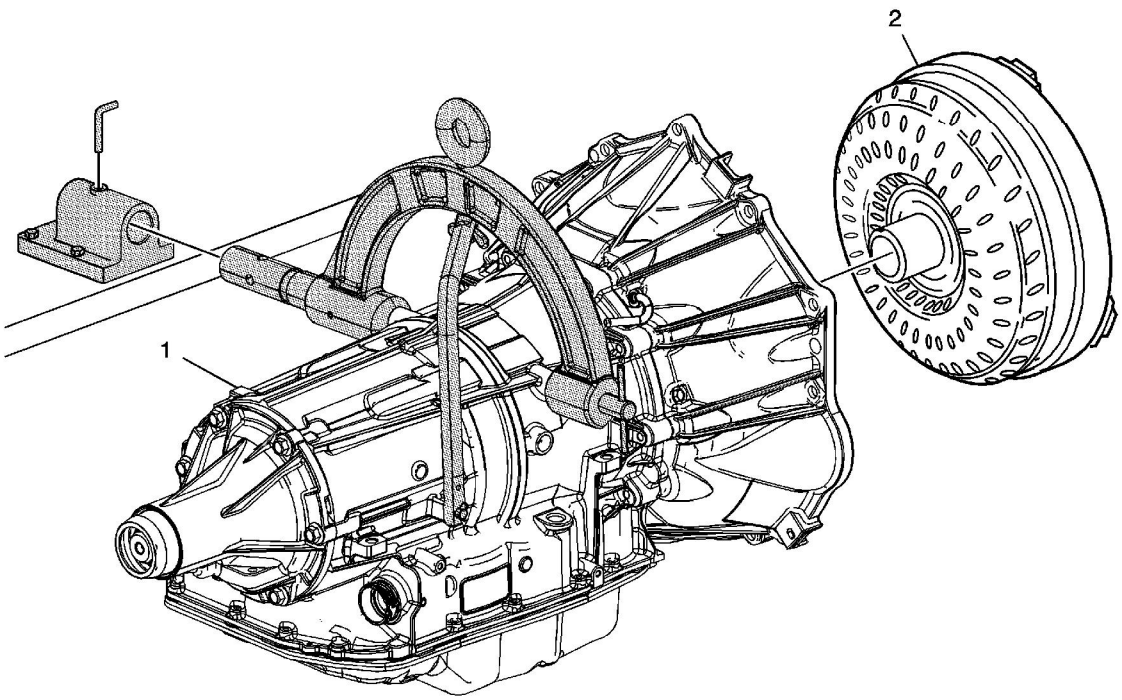
Torque Converter Installation and Holding Fixture Removal (6L80/6L90)



Callout	Procedure
Preliminary Procedure Rotate the transmission so that the fluid pan assembly is down.	
1	Transmission Case Assembly **Special Tools** • DT 47605 Holding Fixture Adapter • J 3289-20 Holding Fixture Base Assembly • J 8763-B Holding Fixture
2	Torque Converter Assembly

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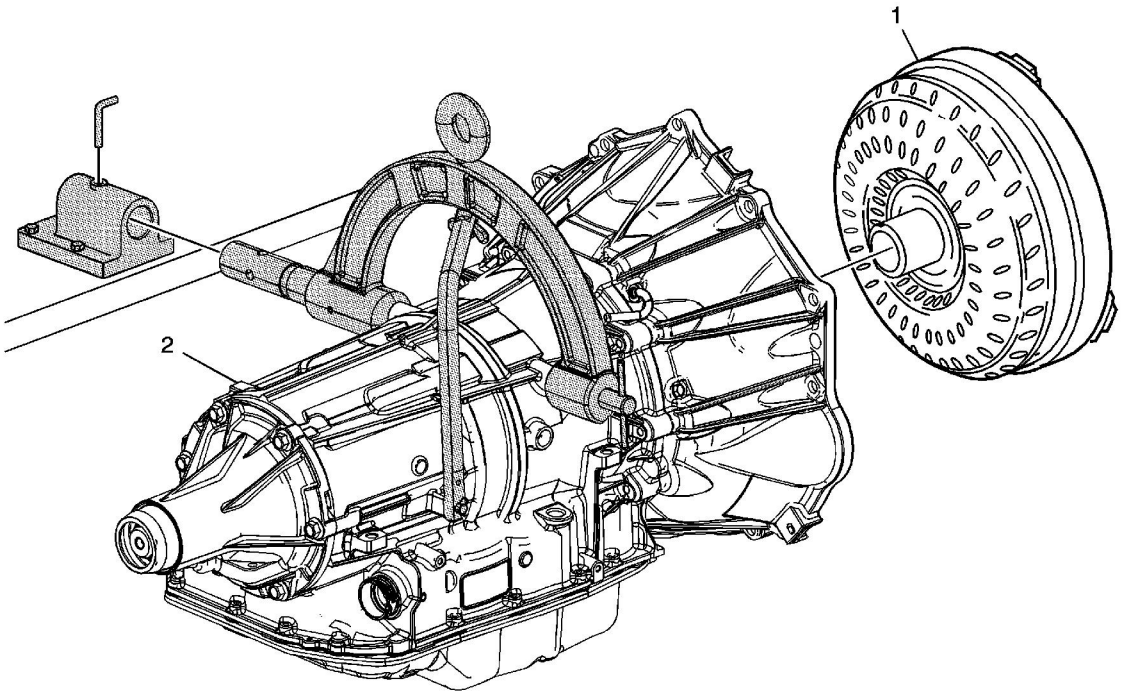
Torque Converter Removal and Holding Fixture Installation



Callout	Component Name
1	Torque Converter Assembly
2	Transmission Case Assembly **Special Tools** • J 8763-B . • DT 47605 . • J 3289-20 .
3	Locking Pin **Tip** 1. Rotate the transmission so that the converter housing is up and secure with locking pin. 2. Allow any remaining transmission fluid to drain from the case extension.

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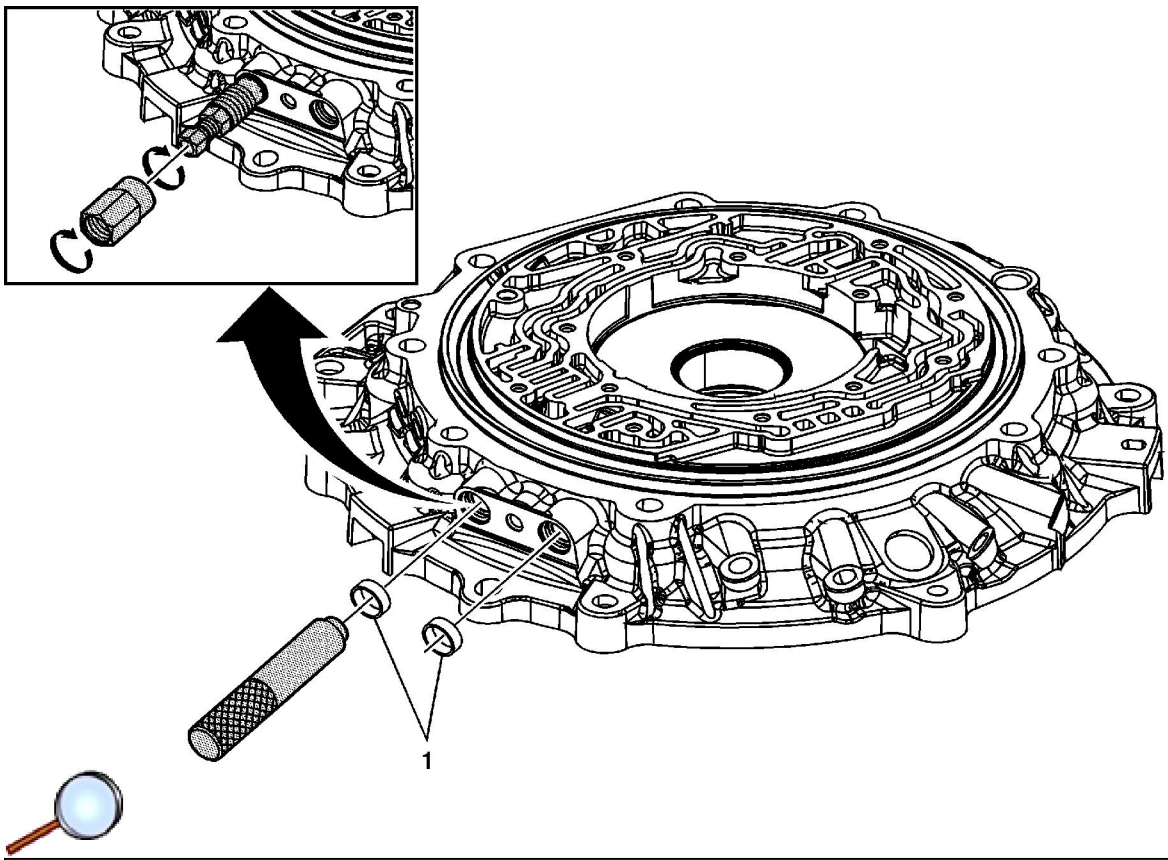
Transmission Fluid Cooler Pipe Seal Replacement



Callout	Component Name
1	Trans Fluid Cooler Pipe Fitting Seals (Quantity: 2) **Special Tools** • DT 47770 Seal Installer • J 45201 Cooler Line Seal Remover

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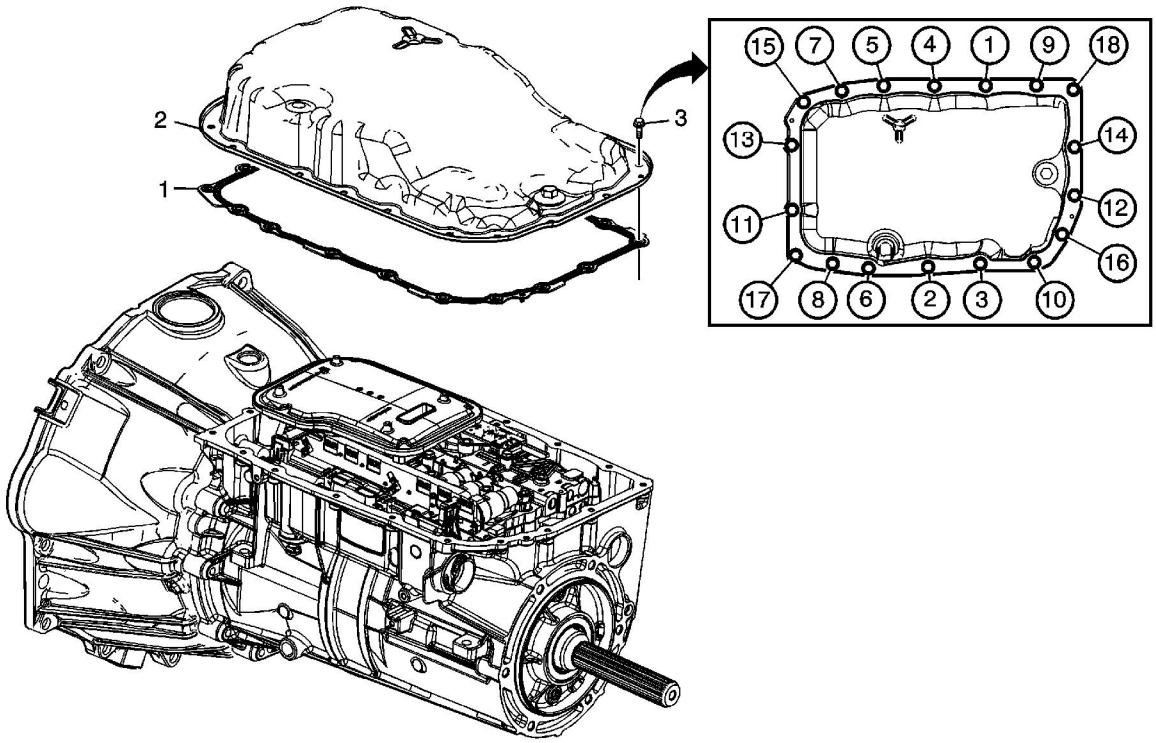
Transmission Fluid Pan Installation



Callout	Component Name
1	Fluid Pan Gasket **Tip** The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.
2	Fluid Pan Assembly
3	Fluid Pan Bolts M6 x 20 (Qty: 18) **Caution:** Refer to Fastener Caution in the Preface section. **Tip** Tighten in sequence shown. **Tighten** 9 N·m (80 lb in)

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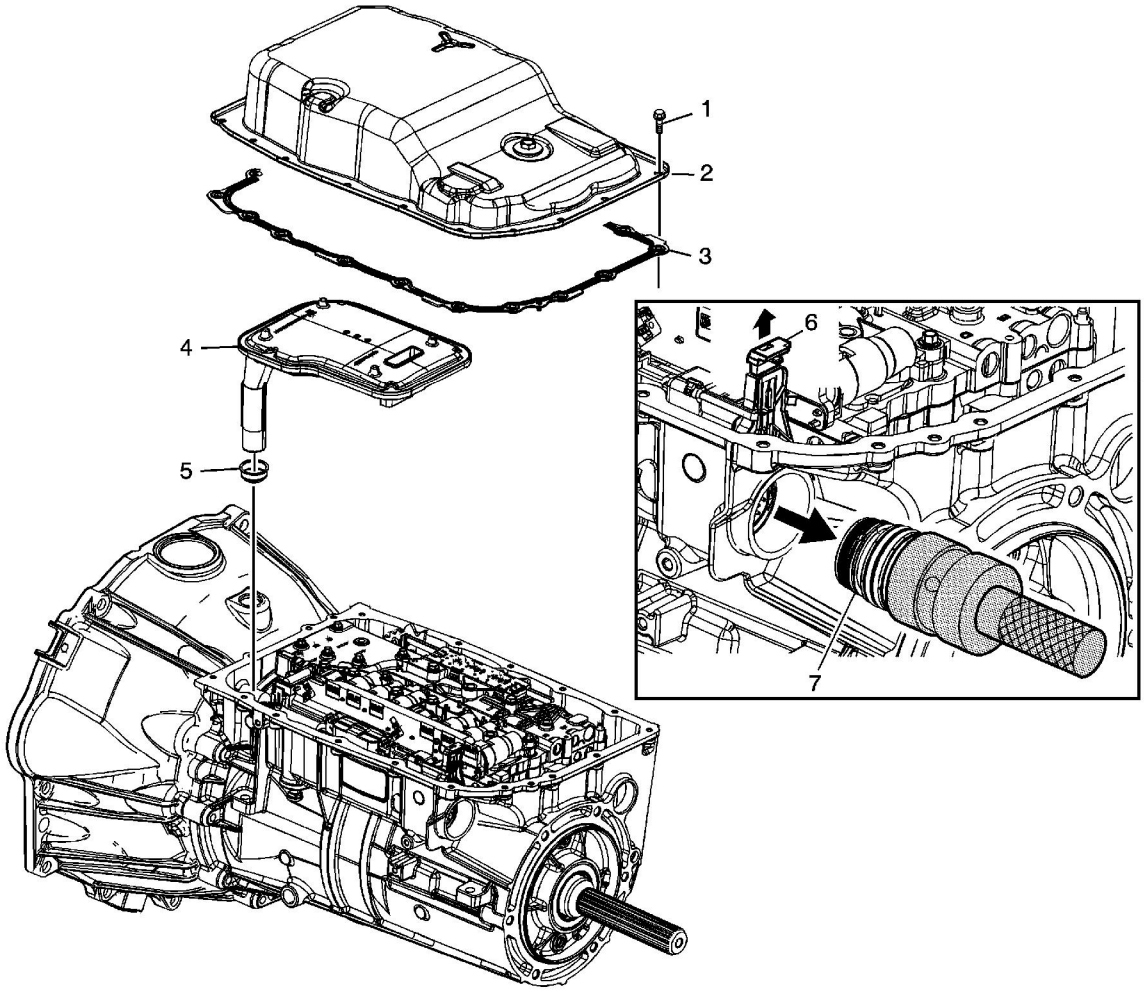
Transmission Fluid Pan, Filter and Electrical Connector Passage Sleeve Removal (6L80)



Callout	Component Name
1	Bolt M6 x 20 (Qty: 18)
2	Fluid Pan Assembly
3	Fluid Pan Gasket **Tip** The fluid pan gasket is reusable. Inspect the gasket to determine if it may be reused. If the gasket is stuck to the case or pan, it should be replaced.
4	Fluid Filter Assembly **Caution:** Pull the fluid filter assembly straight out to avoid damage. Do not bend or

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	twist the filter neck.
5	Fluid Filter Seal Assembly **Caution:** Do not damage the case sealing surface when removing the filter seal assembly. **Tip** Use a screwdriver or snap ring pliers.
6	Electrical Connector Slide Lock **Caution:** Pull up on the electrical connector slide lock to avoid damage to the connector.
7	Electrical Connector Passage Sleeve **Tip** Engage *DT 47715* electrical connector passage sleeve remover/installer on sleeve and pull straight out. **Special Tools** • *DT 47715* Electrical Connector Passage Sleeve Remover/Installer • *J 42183* Driver Handle For equivalent regional tools, refer to Special Tools.